REMARKS

In the Office Action, Claims 46-105 are pending. This present submission amends Claims 46, 47, 48, 49, 56, 67, 78, 79, 80, 81, 86, 91, 96 and 101. The status of claims is as follows:

Cancelled
Claims 1-45

Amended
Claims 50-55
57-66
68-77
81
86
96
101

Twice Amended
46-49
78

Thrice Amended
56, 67, 79, 80

Previously Added
82-85
87-95
97-100
102-105

Updated Reissue Declaration

In item two of the Office Action, it was stated that a supplemental reissue oath or declaration must be received in order to obtain allowance of pending claims 46-105. Applicants respectfully defer submission of the supplemental reissue oath/declaration, and same will be submitted at a later date. This deferral was agreed to by Examiner

Evans and by SPRE Christine Tierney in a teleconference with Linda Deschere on June 21, 2005. Deferral is to a later date after all claims are indicated as allowable except for the fulfillment of the requirement for an updated oath.

Rejection Under 35 U.S.C. § 112

A. Claim 52 was rejected under 35 U.S.C. § 112, first paragraph, on the basis of the term "semiconductor" not appearing within the original disclosure. (Office Action, Page 2, Item #1).

Examiner's attention is respectfully directed to the responsive Remarks filed November 16, 2004 demonstrating that the invention is not limited to any particular material, but instead teaches that the method of the invention is applicable to all materials, of which semiconductor is a species. Such Remarks are incorporated herein.

As further evidence, Applicant respectfully submits herewith that USPN 5,656,186 at **Column 11, Lines 31-34** supports the term "semiconductor," stating:

> These features are important to the applications described above and to related applications such as micro machining, integrated circuit manufacture, and encoding data in data storage media."

The terms "integrated circuit" and "integrated semiconductor" are used interchangeably in the art as evidenced by the Attachment A excerpts from *McGraw-Hill Dictionary of Scientific and Technical Terms*, 3rd Ed. 1984, pages 824 to 825.

Further, by definition, an integrated circuit (integrated semiconductor) contains semiconductor material. Claim 52 is consistent with the specification and the well-known

features of an integrated semiconductor circuit, namely, metal, dielectric and semiconductor.

Given that the present specification teaches conductive, semiconductive and isolative materials and that the specification teaches integrated (semiconductor) circuits, it is respectfully submitted that the term "semiconductor" is appropriately used in the claims and adequately supported in the specification as filed. Thus, withdrawal of this rejection in this Section A under 35 U.S.C. § 112 is respectfully requested.

B. Claims 56, 59-61, 67 and 81-101 were rejected under 35 U.S.C. § 112, first paragraph, on the basis that they fail to comply with the enablement requirement. (Office Action, Page 3, Item #2).

Claims 81, 86, 91, 96 and 101 are rejected on the basis of the term "Rayleigh Range." By this present amendment to independent Claims 81, 86, 91, 96 and 101, the phrase "Rayleigh Range" has been deleted. Therefore, the rejection under 35 U.S.C. § 112 has been obviated.

Claims 56 and 67 were rejected on the basis of the phrase "beam waist". By this present amendment, the phrase "beam waist" has been deleted. Thus, the rejection under 35 U.S.C. §112 has been obviated.

Claims 56, 81, 86, 91, 96 and 101 are rejected on the basis of the term "focusing". Present claims 56, 81, 86, 91, 96 and 101, without the term "focusing", are submitted to be fully enabled at least for the following reasons. Applicant submits the term "focusing" is not necessary since other methods are described to achieve sufficient fluence on or in the material by concentrating energy as described below with specific reference to USPN 5,656,186. The following reasons apply also to claims 59-61 which depend from claim 56, and to claims 82-85 which depend from claim 81, and to claims 87-90 which depend from

claim 86, and to claims 92-95 which depend from claim 91, and to claims 97-100 which depend from claim 96.

It is well established that the patent owner may assert claims which go beyond the specific embodiment shown in the application. See Ethicon Endosurgery, Inc. v. United States Surgical Corp., 93 F.3d 1572, 40 US PQ2d 1019 (Fed. Cir. 1996). (Attachment B)

It is also well established that limitations may not be read into a claim from a preferred embodiment when the claim language is broader than that embodiment. See in Attachment B, Electro Medical Systems, SA v. Cooper Life Sciences, Inc., 32 US PQ2d 1017 (Fed. Cir. 1994), which states:

> Thus, although the specifications may well indicate that certain embodiments are preferred, particular embodiments appearing in the specification will not be read into the claims when the claim language is broader than such embodiments. *See Specialty*, 845 S.2d at 987, 6 USPQ2d at 1605 ("Where a specification does not *require* a limitation, that limitation should not be read from the specification into the claims.").

See also in Attachment B, Resonate Inc. v. Alteon Websystems, Inc., 67 USPQ 1771 (Fed. Cir. 2003), which states:

> Though understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.
>
> * * *
>
> The patentee's apparent choice not to specify a transmission path from the server to the client led the district court to add a limitation that the requested resource be transmitted directly to the client.

But patentees are not required to claim each part of an invention with the same amount of detail.

In a broad aspect, USPN 5,656,186 (herein referred to as US '186) teaches a method of utilizing that portion of the beam that would cause ablation, namely, that portion which exceeds the breakdown threshold fluence. This is achieved by implementing the breakdown threshold fluence at a corresponding pulse width. The teachings of the specification as noted below show that damage will occur at the surface AND IN the material where free electron density exceeds a specific value which is related to breakdown threshold fluence. US '186 further gives an example of a simple focused Gaussian beam, which is a simple and best mode illustration and which has a relatively easily discernable fluence at a desired spot.

In addition, the examples, and particularly Examples 1 and 2, describe and illustrate alternative methods to generate a beam of sufficient energy and desired shape according to the invention and also describe and illustrate the best mode to practice the invention. Accordingly, the specification provides various methods to achieve sufficient fluence by concentrating energy.

In the Summary of the Invention which begins at **Column 1** and continues through **Column 3**, the structure of the description emphasizes the important points in logical order. First, the specification teaches a method which utilizes the physics associated with exceeding the breakdown threshold fluence. Next, the specification teaches that it is possible to generate the beam as a focused Gaussian beam directed at or beneath the surface. Third, a further teaching is provided to teach many other

techniques besides focused Gaussian to generate and direct a beam that exceeds the breakdown threshold at or beneath the surface of the material.

It is important to note that concentrating of energy to increase fluence utilizing a lens is merely a very simple way, in combination with the Gaussian beam, to illustrate exceeding the breakdown threshold fluence. However, the specification is organized so that other general methods to cause such exceeding of breakdown threshold fluence are also able to be utilized. The Summary of the Invention is structured in this way, particularly with reference to **Column 1 Line 50** to **Column 2 Line 10**, which describes the relationship between fluence breakdown threshold and pulse width, then describes the providing of sufficient fluence to achieve the result by concentrating energy. Then, at **Column 2 Lines 44** to **57**, it describes, in one aspect, the achieving of the fluence by the simple method pertaining to the Gaussian profile. Then, see the bottom of **Column 2, Line 63** to the top of **Column 3** at **Line 2** describing the more complex methods for providing a beam shape sufficient to achieve the necessary fluence breakdown threshold.

Example 1 in **Column 5** shows a best mode and relatively simple experimental setup for determining threshold fluence.

In Example 1, specifically at **Column 5, Lines 49-54**, it is stated that for pulses with required pulse energy at or near the threshold for ablation the spatial profile of the beam will determine the shape of the ablation. Additionally, in a broad aspect, US '186 teaches that ablation occurs in a shape that is defined by the beam shape and that a variety of beam patterns, including focused Gaussian and alternatives to Gaussian,

such as complex patterns without lens or focus may be utilized. See, **Column 6, Lines 42-50** and **Column 6, Lines 58-65**, and particularly the description of a non-circular or non-Gaussian beam.

In Example 2 of **Column 7,** and particularly **Lines 40-41**, an assumption of a Gaussian beam profile is made to simplify the explanation of the related experiment. The use of a Gaussian beam for such a purpose only serves to clarify that damage occurs where the pulse fluence exceeds the breakdown threshold fluence.

One of ordinary skill would naturally understand that a best mode and relatively simple case as stated in the specification, and particularly with reference to Examples 1 and 2, shows a best mode case for illustrating the broader teaching that the beam shape determines the breakdown shape, and any method of choice as taught may be selected to provide the same result. Such other methods of choice are, for example, Fourier Transform, operation in non-TEMoo mode, and other shaping, as stated in **Column 2, Line 63 to Column 3, Line 2** and **Column 6, Lines 42-65,** for the purpose of showing beam shaping. Fourier Transform ("FT") shaping which does not rely on a lens or focus was known at least as early as its publication in the textbook entitled *Optics*, by E. Hecht and A. Zajac (1974, Addison-Wesley). See Attachment D containing a description of excerpts from the *Optics* textbook, and particularly Chapters 11 and 14 pertaining directly to Fourier Optics, and Chapter 7 pertaining generally to the basic concept of superposition. An IDS filed herewith contains Chapter 7, 11 and 14 of *Optics*.

Furthermore, one of ordinary skill would understand that the shape of the ablation would follow the shape of the beam pattern where it exceeded the fluence breakdown threshold as described in the lower half of **Column 6.**

Note particularly **Column 6** at **Lines 58-65** which describes "operation in other than TEMoo mode" which means that "the beam need not be circular or Gaussian."

Thus, one of ordinary skill would understand that a beam pattern, formed by the variety of methods stated, are scanned beneath the surface of the material and ablation occurs where the fluence breakdown threshold is exceeded. To further ensure this understanding, US '186 further teaches that a specific mechanism for damage may be avalanche ionization and provides formulae where the fluence for damage is determinable according to measured coefficients. See mathematical derivations in the last half of **Column 7** to the top of **Column 8** and, substantially, all of **Columns 9 and 10**. These teachings show that when the beam or pulse is directed to the material with or without focusing, encompassing any one or more of adjacent, at and beneath, damage will occur at the surface and in the material where free electron density exceeds a specific value which is related to breakdown threshold fluence.

In conclusion, the 5,656,186 teachings show that damage will occur at the surface AND IN the material where free electron density exceeds a specific value which is related to breakdown threshold fluence. Thus, the specification teaches how to use a simple Gaussian beam to create patterns in a material, and states that the "basic method of the invention" may be employed utilizing alternatives to create patterns in a material. Thus, the inventors showed generally how to "scan a beam" of a more

complex nature "along a predetermined path beneath the surface of a material" without restricting the method to only a focused Gaussian beam.

Applying the applicable law to the present Application, it is evident that limitations pertaining to a particular embodiment are not to be read into the claims. As a result, present claims 56, 81, 86, 91, 96 and 101 are fully supported by the specification which meets the requirements of 35 U.S.C. § 112. Additionally, the following claims are fully supported, 59-61, 67, 82-85, 87-90, 92-95 and 97-100.

For the foregoing reason(s), withdrawal of this rejection of the above-referenced claims in this Section **B** under 35 U.S.C. § 112 is respectfully requested.

Rejection Under 35 U.S.C. § 102

A. Claims 46, 48, 49, 50, 51/46, 51/48, 51/49, 51/50, 52/46, 52/48, 52/49, 52/50, 55/46, 55/48, 55/49, 55/50, 57/46, 57/48, 57/49, 57/50, 58/46, 58/48, 58/49, 58/50, 61/56/46, 61/55/48, 61/56/49, 61/56/50, 62/55/46, 62/55/48, 62/55/49, 62/55/50, 63/46, 63/48, 63/49, 63/50, 69/46, 69/48, 69/49, 69/50, 70/46, 70/48, 70/49, 70/50, 72/46, 72/48, 72/49, 72/50, 73/46, 73/48, 73/49, 73/50, and 78 were rejected under 35 U.S.C. § 102(b) as being anticipated by Ihlemann et al. in the article "Nanosecond and Femtosecond Excimer Laser Ablation of Fused Silica." **(Office Action, Page 4, Item #4).**

The Office Action at Pages 4-5 and 10 describes the basis for the rejection based on Ihlemann. The Office Action states that Ihlemann's Figure 1 shows making holes in SiO_2 with 500 femtosecond pulses and that Ihlemann's breakdown at a 500 femtosecond pulse width must be essentially accurate. A further basis includes that the claims do not require any specific energy. A still further basis is that the term "essentially accurate" is not

adequately defined so as to distinguish over Ihlemann since Ihlemann mentions "gentle etching at low abrasion rate followed by explosive sputtering".

The past and present Office Actions do not make a prima facia case for rejection on the basis of Ihlemann. The assumptions contained in the Office Action at pages 4-5 and 10 are not supportable for the reasons given below and for the reasons given in the earlier response filed 16 November 2004.

Ihlemann, et al report a series of experiments using a number of lasers where the material removal rates are recorded as a function of laser fluence. See attached Declaration of John Nees describing Figure 1 of Ihlemann. (See Nees Declaration, Attachment E.)

Ihlemann contrasts gentle etching at low material removal rate with explosive sputtering at high material removal rate. Ihlemann's graphical representations show microns per pulse, indicating the amount of material removed, corresponding to depth thereof. (See Nees Declaration, Attachment E.)

These material removal rates are demonstrated for multiple pulses delivered after the material has already been exposed to conditioning pulses, typically 20 to 40 such pulses. (See Nees Declaration, Attachment E.)

Ihlemann's mentioning of the term "gentle" only pertains to material removal rate and only after the surface has been preconditioned by delivery of a sequence of earlier pulses. Ihlemann at Figure 1 and page 367 make it clear that the conditions of "gentle etching" and "explosive sputtering" depend on amount of material removed and do not depend on pulse width. There is no difference between the nanosecond data and the 500 femtosecond data. There is no reference to accurate machining in Ihlemann. (See Nees Declaration, Attachment E.)

Ihlemann does not identify a threshold energy for material removal at all. Ihlemann never varies pulse duration. Ihlemann never recognizes there is a breakpoint because he doesn't relate breakdown threshold fluence to pulse duration. (See Nees Declaration, Attachment E.)

Ihlemann's failure to show a relationship between pulse duration and breakdown threshold fluence is evidenced by Figure 1 that contains a graph of data represented by diamonds and squares. The diamond curve data is for pulse duration of 500 femtoseconds. The square curve data is for pulse duration of 22 nanoseconds. (See Nees Declaration, Attachment E.)

There is no difference between the performance curve of 500 femtosecond pulses and the 22 nanosecond pulses. The two curves coincide. Thus, Ihlemann makes no distinction between the 500 femtosecond pulse and the 22 nanosecond pulse performance in ablation (material removal) rate as a function of fluence. (See Nees Declaration, Attachment E.)

It is impermissible to overlook the importance of the relationship of fluence breakdown threshold and laser pulse width of the present invention. It is impermissible to interpret Ihlemann as teaching any features of the independent claims 46-48 and 78.

The present Office Action, as in previous Office Actions, focuses only on short pulses without any recognition at all that breakdown threshold fluence is related to pulse width to cause accurate machining.

Independent Claim 46 has been amended herewith to further emphasize the relationship between pulse width and its corresponding breakdown threshold fluence, and further enhances clarity with regard to the term "essentially accurate".

Independent Claims 48, 49 and 78 have been amended herewith to further emphasize the relationship between pulse width and its corresponding breakdown threshold fluence.

Claim 50 includes the relationship between pulse width at its corresponding breakdown threshold fluence.

In contrast to the features of independent claims 48, 49, 50 and 78, Ihlemann relates material removal rate to fluence. Ihlemann does not recognize a relationship between fluence breakdown threshold and pulse width. Ihlemann states there is no difference between a 500 femtosecond pulse and a 22 nanosecond pulse, as evidenced by his own data in Figure 1. Ihlemann ignores that fluence is coupled with pulse width in order to achieve essentially accurate breakdown. There are no error bars showing regime of increased accuracy.

It is respectfully submitted that the rejection of independent claims 46-48 and 78 on the basis of Ihlemann should be withdrawn.

Dependent claims recited herein immediately above depend directly or indirectly on independent Claims 46, 48, 49 and 50 and are patentable over Ihlemann for the reasons given above.

The Office Action also includes a statement concerning the laws of nature being free to all men and reserved exclusively to none. However, it is well established by the Supreme Court in *Diamond v Diehr*, 450 U.S. 175, 67 L. Ed. 2d 155, 101 S. Ct. 1048 that "a process is not unpatentable simply because it contains a law of nature or a mathematical algorithm...it is now commonplace that an application of a law of nature or mathematical formula to a known structure or process may be deserving of patent protection. See, e.g., Funk Brothers Seed."

For the foregoing reason(s), withdrawal of this rejection of the above-referenced claims in this Section **A** under 35 U.S.C. § 102 is respectfully requested.

B. Claims 46, 48-50, 51/46, 51/48, 51/49, 51/50, 52/46, 52/48, 52/49, 52/50, 55/46, 55/48, 55/49, 55/50, 57/46, 57/48, 57/49, 57/50, 58/57/46, 58/57/48, 58/57/49, 58/57/50, 62/46, 62/48, 62/49, 62/50, 63/46, 63/48, 63/49, 63/50, 65/46, 65/48, 65/49, 65/50, 68/46, 68/48, 68/49, 68/50, 69/46, 69/48, 69/49, 69/50, 71/46, 71/48, 71/49, 71/50, 72/46, 72/48, 72/49, 72/50, 73/46, 73/48, 73/49, 73/50 and 78 are rejected under 35 U.S.C. 102(e) as being anticipated by Alexander (USPN 6,489,589 B1). **(Office Action, Page 5, Item #5).**

Alexander is said to disclose laser machining of stainless steel, gold, copper, iron, nickel, titanium, silicone and diamond using a pulse width of 150 femtosecond duration and it is alleged and assumed that Alexander's machining is essentially accurate. The rejection based on Alexander is similar to the rejection based on Ihlemann; and Alexander is addressed on pages 5 and 11 of the Office Action.

The Office Action assumes that Alexander is capable of material removal in a manner that is essentially accurate on the basis of the extent of heat transfer to surrounding areas.

Past and present Office Actions do not make a prima facia case for rejection on the basis of Alexander. The assumptions contained in the Office Action at pages 5 and 11 are not supportable for the reasons given below and for the reasons given in the earlier response filed 16 November 2004.

It is respectfully submitted that Alexander is completely devoid of any teachings relevant to the present invention and further that the conditions and teachings of Alexander lead to significant collateral damage during laser machining as is demonstrated by the accompanying declaration of expert, John Nees, as described herein below. (See Nees Declaration, Attachment E.)

In **Column 9, lines 30-37**, Alexander gives the following parameters: a 3μm spot size (7×10^{-8} cm^2), a pulse duration of 150fs, and a pulse energy of 50mJ. This produces a fluence of energy/area equal to ~7×10^5 J/cm^2. This fluence is five orders of magnitude over the damage threshold of the material. (See Nees Declaration, Attachment E.)

In fact, John Nees has conducted experiments for damage in glass induced at a fluence of 10E5 joules per cm2 ($10^5 J/cm^2$) with the spacing between damage spots of 4 microns. (See Nees Declaration, Attachment E.)

Fig. A of the Nees Declaration at Attachment E shows John Nees's experiments where damage induced is by a femtosecond laser at a fluence of only 1×10^5 J/cm^2 with 1.1 mJ in a 1.2 μm spot. In both Alexander and John Nees's essentially identical conditions, the intensity was about $10^{18} W/cm^2$ and x-rays (ionizing radiation) were produced. The damage sites are spaced by 40μm, enabling one to see that physical damage and cracking extend tens of microns from the central location of the damage. This level of irradiation per Alexander is preposterously high for machining applications, especially when minimal collateral damage is desired. (See Nees Declaration, Attachment E.)

Clearly, the parameters given in Alexander lead to significant collateral damage. (See Nees Declaration, Attachment E.)

Alexander states that shielding should be employed, as x-rays will be produced. This is because Alexander causes so much collateral damage. (See Nees Declaration, Attachment E.)

Alexander does not teach that the shape of the affected area is substantially determined solely by the beam shape and fluence near the breakdown threshold fluence. (See Nees Declaration, Attachment E.)

Alexander's parameters so far exceed the threshold that it is impossible to achieve or come close to determining a breakdown threshold. (See Nees Declaration, Attachment E.)

In contrast, Mouoru '186 clearly demonstrates and teaches that near the breakdown threshold fluence, the shape of the affected area is substantially determined solely by the beam shape and fluence. See Mouoru, **Column 5 lines 62** to **64.** (See Nees Declaration, Attachment E.)

Alexander is concerned only with the rate at which pulses are generated. That is, pulse repetition rate. Alexander's repetition rate is the key feature of all of Alexander's claims. (See Nees Declaration, Attachment E.)

Alexander is essentially devoid of useful teachings since Alexander's **Columns 2-9** describe background physics as admitted in Alexander. The exemplary embodiments of Alexander beginning at **Column 9** reveal very little except for the preposterous levels of energy and the importance of the repetition rate as disclosed in Alexander's claims. (See Nees Declaration, Attachment E.)

Claims 46, 48-50 and 78 and dependent claims recited herein immediately above depending directly or indirectly on independent Claims 46, and 48-50 are patentable over Alexander for the reasons given above and at least because Alexander fails to disclose the

relationship between pulse width and breakdown threshold fluence and a method to achieve essentially accurate breakdown.

For the foregoing reason(s), withdrawal of this rejection of the above-referenced claims in this Section **B** under 35 U.S.C. § 102 is respectfully requested.

Rejection Under 35 U.S.C. § 103

A. Claims 47, 51/47, 52/47, 55/47, 56, 59, 60, 61, 58/47, 62/55/47, 63/47, 65/47, 66/47, 69/47, 70/47, 71/47, 72/47 and 73/47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ihlemann et al. in view of Lai (USPN 5,984,916). **(Office Action, Page 7, Item #8).** Y. Lai is said to show the creating of an interaction zone that is smaller than the wavelength. Lai does not supply the deficiencies of Ihlemann as described hereinabove.

For the foregoing reason(s), withdrawal of this rejection of the above-referenced claims in this Section **A** under 35 U.S.C. § 103 is respectfully requested.

B. Claims 64/46, 64/48, 64/49 and 64/50 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ihlemann et al. in view of Mourou et al. (USPN 5,235,606). **(Office Action, Page 7, Item #9).**

Mourou '606 teaches a method and systems for generating a short optical pulse. There is no suggestion of the pulse width/threshold relationship to achieve ablation without collateral damage. Thus, Mourou '606 does not supply the deficiencies of Ihlemann.

For the foregoing reason(s), withdrawal of this rejection of the above-referenced claims in this Section **B** under 35 U.S.C. §103 is respectfully requested.

C. Claims 64/47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ihlemann et al. in view of Lai as applied to Claim 47, and further in view of Mourou '606 **(Office Action, Page 7, Item #10).**

Lai and Mourou '606 alone or in combination, do not supply the deficiencies of Ihlemann, et al. for the reasons given above.

For the foregoing reason(s), withdrawal of this rejection of the above-referenced claims in this Section **C** under 35 U.S.C. § 103 is respectfully requested.

D. Claims 65/46, 65/48, 65/49, and 65/50 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ihlemann et al. in view of Stuke et al. (USPN 5,243,589). **(Office Action, Page 8, Item #11.)**

Claim 65 depends from Claims 46-50 and defines scanning a beam along a workpiece. Stuke et al. describes moving a sample relative to radiation. Stuke et al. does not supply the deficiencies of Ihlemann et al.

For the foregoing reason(s), withdrawal of the rejection of the above-referenced claims in this Section **D** under 35 U.S.C. § 103 is respectfully requested.

E. Claims 47, 51/47, 52/47, 55/47, 56, 57/47, 58/47, 59, 60, 61, 62/47, 63/47, 65/47, 66, 68/47, 69/47, 70/47, 71/47, 72/47, and 73/47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Alexander in view of Lai. **(Office Action, Page 8, Item #12.)**

This rejection of Alexander in view of Lai is similar to the rejection of Ihlemann in view of Lai above. **(Office Action, Page 7, Item #8.)** Lai is suggested to show creating an interaction zone. However, Lai does not supply the deficiencies of Alexander.

For the foregoing reason(s), withdrawal of this rejection of the above-referenced claims in this Section **E** under 35 U.S.C. § 103 is respectfully requested.

F. Claims 64/46, 64/48, 64/49, 64/50 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Alexander in view of Mourou '606. **(Office Action, Page 8, Item #13.)**

This rejection on the basis of Alexander in view of Mourou '606 is similar to the rejection based on Ihlemann et al. in view of Mourou '606 above. **(Office Action, Page 7, Item #9.)**

Mourou '606 teaches a method and systems for generating a short optical pulse. There is no suggestion of the pulse width/threshold relationship to achieve ablation without collateral damage. Thus, Mourou '606 does not supply the deficiencies of Alexander.

For the foregoing reason(s), withdrawal of this rejection of the above-referenced claims in this Section **F** under 35 U.S. C. § 103 is respectfully requested.

G. Claims 64/47 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Alexander in view of Lai as applied to Claim 47, and further in view of Mourou '606 **(Office Action, Page 9, Item #14.)**

This rejection is similar to the rejection of Claim 64/47 on the basis of Ihlemann et al. in view of Lai as applied to Claim 47, and further in view of Mourou '606 above. **(Office Action, Page 7, Item #10.)**

Lai and Mourou '606, alone or in combination, do not supply the deficiencies of Alexander for the reasons give above.

For the foregoing reason(s), withdrawal of this rejection of the above-referenced claims in this Section **G** under 35 U.S.C. § 103 is respectfully requested.

H. Claims 53/52/46, 53/52/48, 53/53/49 [sic], 53/52/50, 54/53/52/46, 54/53/52/48, 54/53/52/49, 54/53/52/50, 79, and 80 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Alexander in view of Wojnarowski et al. (USPN 5,104,480). **(Office Action, Page 9, Item #15.)**

The basis of this rejection is that Wojnarowski et al. teaches laser machining of gold and it would have been obvious to adapt Alexander in view of Wojnarowski to create an integrated circuit on a substrate.

Wojnarowski et al. does not supply the deficiencies of Alexander to support this rejection, since Wojnarowski specifically teaches to "burn off" layers together (see abstract, claims and objects of Wojnarowski). In Wojnarowski, the laser burns material off a substrate, thus clearly collateral damage and thermal effects occur.

For the foregoing reason(s), withdrawal of this rejection of the above-referenced claims in this Section **H** under 35 U.S.C. § 103 is respectfully requested.

I. Claims 53/52/47, 54/53/52/47 and 68/47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Alexander in view of Lai as applied to Claim 47, and further in view of Wojnarowski et al. **(Office Action, Page 9, Item #16.)**

For the reasons given above, Lai and Wojnarowski et al., alone or in combination, do not supply the deficiencies of Alexander.

For the foregoing reason(s), withdrawal of this rejection of the above-referenced claims in this Section **I** under 35 U.S.C. § 103 is respectfully requested.

Subject Matter Allowable Over the Art

It is acknowledged with appreciation that Claims 64, 74-77, and 81-105 patentably define over the art of record.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested.

If this present submission does not result in allowance of all claims, the Examiner is requested to telephone the undersigned at (248) 641-1600 before issuing another Office Action.

Respectfully submitted,

Dated: 14 September 2005

By: _____
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Index of Attachments:

Attachment A: Copies of Excerpts from *McGraw-Hill Dictionary of Scientific and Technical Terms*, 3d Ed. (1984, McGraw-Hill)
Attachment B: Copies of Cited Case Law
Attachment C: Highlighted Copy of U.S. Patent No. 5,656,186
Attachment D: Description of Excerpts from Textbook Entitled: Optics, by E. Hecht and A. Zajac (1974, Addison-Wesley)
Attachment E: Declaration of John Nees under 37 C.F.R. § 1.132

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Third Edition

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In addition, material has been drawn from the following references: R. E. Huschke, *Glossary of Meteorology*, American Meteorological Society, 1959; *U.S. Air Force Glossary of Standardized Terms*, AF Manual 11-1, vol. 1, 1972; *Communications-Electronics Terminology*, AF Manual 11-1, vol. 3, 1970; W. H. Allen, ed., *Dictionary of Technical Terms for Aerospace Use*, 1st ed., National Aeronautics and Space Administration, 1965; J. M. Gilliland, *Solar-Terrestrial Physics: A Glossary of Terms and Abbreviations*, Royal Aircraft Establishment Technical Report 67158, 1967; *Glossary of Air Traffic Control Terms*, Federal Aviation Agency; *A Glossary of Range Terminology, White Sands Missile Range, New Mexico*, National Bureau of Standards, AD 467-424; *A DOD Glossary of Mapping, Charting and Geodetic Terms*, 1st ed., Department of Defense, 1967; P. W. Thrush, comp. and ed., *A Dictionary of Mining, Mineral, and Related Terms*, Bureau of Mines, 1968; *Nuclear Terms: A Glossary*, 2d ed., Atomic Energy Commission; F. Casey, ed., *Compilation of Terms in Information Sciences Technology*, Federal Council for Science and Technology, 1970; *Glossary of Stinfo Terminology*, Office of Aerospace Research, U.S. Air Force, 1963; *Naval Dictionary of Electronic, Technical, and Imperative Terms*, Bureau of Naval Personnel, 1962; *ADP Glossary*, Department of the Navy, NAVSO P-3097.

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insulin shock therapy [MED] Administration of large doses of insulin to induce hypoglycemic comas, followed by administration of glucose, in the treatment of certain psychotic disorders.

insuloma *See* islet-cell tumor.

intaglio [LAP] A type of carved gemstone in which the figure is engraved on the surface of the stone rather than left in relief by cutting away the background, as in a cameo.

intaglio plate [GRAPHICS] A metal surface into which the printing elements are formed in intaglio printing.

intaglio printing [GRAPHICS] A printing method in which the printing elements are all below the plate surface, having been cut, scratched, engraved, or etched into the metal to form ink-retaining grooves or cups; surplus ink on the surface must be wiped or scraped off after each inking and before each printing impression.

intake [ENG] **1.** An entrance for air, water, fuel, or other fluid, or the amount of such fluid taken in. **2.** A main passage for air in a mine. [HYD] *See* recharge.

intake area *See* recharge area.

intake chamber [CIV ENG] A large chamber that gradually narrows to an intake tunnel; designed to avoid undesirable water currents.

intake gate [CIV ENG] A movable partition for opening or closing a water intake opening.

intake manifold [MECH ENG] A system of pipes which feeds fuel to the various cylinders of a multicylinder internal combustion engine.

intake stroke [MECH ENG] The fluid admission phase or travel of a reciprocating piston and cylinder mechanism as, for example, in an engine, pump, or compressor.

intake valve [MECH ENG] The valve which opens to allow air or an air-fuel mixture to enter an engine cylinder.

intarsia [GRAPHICS] Decorative designs of inlaid wood in a background of wood; often used in furniture making. Also known as tarsia. FA[text] A pattern in several colors, usually geometrical, in a knitted fabric in which both sides of the fabric are alike.

integer [MATH] Any positive or negative counting number or zero.

integer constant [COMPUT SCI] A constant that uses the values 0, 1, . . . , 9 with no decimal point in FORTRAN.

integer data type [COMPUT SCI] A scalar date type which is used to represent whole numbers, that is, values without fractional parts.

integer programming [SYS ENG] A series of procedures used in operations research to find maxima or minima of a function subject to one or more constraints, including one which requires that the values of some or all of the variables be whole numbers.

integer spin [QUANT MECH] Property of a particle whose spin angular momentum is a whole number times Planck's constant divided by 2π; bosons have this property; in contrast, fermions have half-integer spin.

integer variable [COMPUT SCI] A variable in FORTRAN whose first character is normally I, J, K, L, M, or N.

integral [MATH] **1.** A solution of a differential equation is sometimes called an integral of the equation. **2.** *See* definite Riemann integral; indefinite integral.

integral absorbed dose *See* integral dose.

integral action [CONT SYS] A control action in which the rate of change of the correcting force is proportional to the deviation.

integral calculus [MATH] The study of integration and its applications to finding areas, volumes, or solutions of differential equations.

integral compensation [CONT SYS] Use of a compensator whose output changes at a rate proportional to its input.

integral control [CONT SYS] Use of a control system in which the control signal changes at a rate proportional to the error signal.

integral discriminator [ELECTR] A circuit which accepts only pulses greater than a certain minimum height.

integral domain [MATH] A commutative ring with identity where the product of nonzero elements is never zero. Also known as entire ring.

integral dose [NUCLEO] The total energy imparted to an irradiated body by an ionizing radiation; usually expressed in gram-rads or gram-roentgens. Also known as integral absorbed dose; volume dose.

integral equation [MATH] An equation where the unknown function occurs under an integral sign.

integral function [MATH] **1.** A function taking on integer values. **2.** *See* entire function.

integral-furnace boiler [MECH ENG] A type of steam boiler which incorporates furnace water-cooling in the circulatory system.

integral heat of dilution *See* heat of dilution.

integral heat of solution *See* heat of solution.

integral-joint casing [PETRO ENG] Oil well casing lengths on whose ends the connection joints are integrally formed.

integral-mode controller [CONT SYS] A controller which produces a control signal proportional to the integral of the error signal.

integral network [CONT SYS] A compensating network which produces high gain at low input frequencies and low gain at high frequencies, and is therefore useful in achieving low steady-state errors. Also known as lagging network; lag network.

integral operator [MATH] A rule for transforming one function into another function by means of an integral; this often is in context a linear transformation on some vector space of functions.

integral procedure decomposition temperature [PHYS CHEM] Decomposition temperatures derived from graphical integration of the thermogravimetric analysis of a polymer.

integral square error [CONT SYS] A measure of system performance formed by integrating the square of the system error over a fixed interval of time, this performance measure and its generalizations are frequently used in linear optimal control and estimation theory.

integral test [MATH] If $f(x)$ is a function that is positive and decreasing for positive x, then the infinite series with nth term $f(n)$ and the integral of $f(x)$ from 1 to ∞ are either both convergent (finite) or both infinite.

integral transform *See* integral transformation.

integral transformation [MATH] A transform of a function $F(x)$ given by the function

$$f(y) = \int_a^b K(x,y)F(x)\,dx$$

where $K(x,y)$ is some function. Also known as integral transform.

integral-type flange [DES ENG] A flange which is forged or cast with, or butt-welded to, a nozzle neck, pressure vessel, or piping wall.

integral waterproofing [ENG] Waterproofing concrete by adding the waterproofing material to the cement or to the mixing water.

integrand [MATH] The function which is being integrated in a given integral.

integraph [ENG] A device used for completing a mathematical integration by graphical methods.

integrated circuit [ELECTR] An interconnected array of active and passive elements integrated with a single semiconductor substrate or deposited on the substrate by a continuous series of compatible processes, and capable of performing at least one complete electronic circuit function. Abbreviated IC. Also known as integrated semiconductor.

integrated-circuit capacitor [ELECTR] A capacitor that can be produced in a silicon substrate by conventional semiconductor production processes.

integrated-circuit memory *See* semiconductor memory.

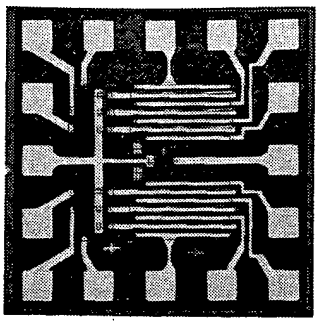
integrated-circuit resistor [ELECTR] A resistor that can be produced in or on an integrated-circuit substrate as part of the manufacturing process.

integrated communications-navigation-identification [NAV] The concept of coordinating the electronic units of a system to improve the efficiency of providing communications, navigation, and identification for civilian and military aircraft. Abbreviated ICNI.

integrated communications system [COMMUN] Communications system on either a unilateral or joint basis in which a message can be filed at any communications center in that system and be delivered to the addressee by any other appropriate communications center in that system without reprocessing enroute.

integrated console [COMMUN] Computer control console that is capable of controlling the operation of the switching center equipment of an integrated communications system.

INTEGRATED CIRCUIT



Photomicrograph of a simple MOS (metal oxide semiconductor) integrated circuit, a three-input logic gate circuit.

integrated data processing [COMPUT SCI] Data processing that has been organized and carried out as a whole, so that intermediate outputs may serve as inputs for subsequent processing with no human copying required. Abbreviated IDP.

integrated data retrieval system [COMPUT SCI] A section of a data-processing system that provides facilities for simultaneous operation of several video-data interrogations in a single line and performs required communications with the rest of the system; it provides storage and retrieval of both data subsystems and files and standard formats for data representation.

integrated drainage [HYD] Drainage resulting after folding and faulting of a surface under arid conditions; the streams by working headward have joined basins across intervening mountains or ridges.

integrated electronics [ELECTR] A generic term for that portion of electronic art and technology in which the interdependence of material, device, circuit, and system-design consideration is especially significant; more specifically, that portion of the art dealing with integrated circuits.

integrated fire control system [ORD] A system which combines target acquisition and tracking data computation, and weapon laying and firing, primarily using electronic means assisted by electromechanical devices.

integrated information processing [COMPUT SCI] System of computers and peripheral systems arranged and coordinated to work concurrently or independently on different problems at the same time.

integrated information system [COMMUN] An expansion of a basic information system achieved through system design of an improved or broader capability by functionally or technically relating two or more information systems, or by incorporating a portion of the functional or technical elements of one information system into another.

integrated injection logic [ELECTR] Integrated-circuit logic that uses a simple and compact bipolar transistor gate structure which makes possible large-scale integration on silicon for logic arrays, memories, watch circuits, and various other analog and digital applications. Abbreviated I^2L. Also known as merged-transistor logic.

integrated neutron flux [NUCLEO] A measure of radiation exposure, equal to the product of the number of free neutrons per unit volume, the average speed of neutrons, and the exposure time.

integrated optics [OPTICS] A thin-film device containing tiny lenses, prisms, and switches to transmit very thin laser beams, and serving the same purposes as the manipulation of electrons in thin-film devices of integrated electronics.

integrated semiconductor *See* integrated circuit.

integrated train [MIN ENG] A long string of cars, permanently coupled together, that shuttles endlessly between one mine and one generating plant, not even stopping to load and unload, since rotary couplers permit each car to be flipped over and dumped as the train moves slowly across a trestle.

integrating accelerometer [ENG] A device whose output signals are proportional to the velocity of the vehicle or to the distance traveled (depending on the number of integrations) instead of acceleration.

integrating amplifier [ELECTR] An operational amplifier with a shunt capacitor such that mathematically the waveform at the output is the integral (usually over time) of the input.

integrating detector [ELECTR] A frequency-modulation detector in which a frequency-modulated wave is converted to an intermediate-frequency pulse-rate modulated wave, from which the original modulating signal can be recovered by use of an integrator.

integrating factor [MATH] A factor which when multiplied into a differential equation makes the portion involving derivatives an exact differential.

integrating filter [ELECTR] A filter in which successive pulses of applied voltage cause cumulative buildup of charge and voltage on an output capacitor.

integrating frequency meter [ENG] An instrument that measures the total number of cycles through which the alternating voltage of an electric power system has passed in a given period of time, enabling this total to be compared with the number of cycles that would have elapsed if the prescribed frequency had been maintained. Also known as master frequency meter.

integrating galvanometer [ENG] A modification of the d'Arsonval galvanometer which measures the integral of current over time; it is designed to be able to measure changes of flux in an exploring coil which last over periods of several minutes.

integrating gyroscope [ENG] A gyroscope that senses the rate of angular displacement and measures and transmits the time integral of this rate.

integrating meter [ENG] An instrument that totalizes electric energy or some other quantity consumed over a period of time.

integrating network [ELECTR] A circuit or network whose output waveform is the time integral of its input waveform. Also known as integrator.

integrating-sphere photometer [OPTICS] An instrument for measuring the total luminous flux of a lamp or luminaire; the source is placed inside a sphere whose inside surface has a diffusely reflecting white finish, and the light reflected from this surface onto a window is measured by an ordinary photometer. Also known as sphere photometer.

integrating water sampler [ENG] A water sampling device comprising a cylinder with a free piston whose movement is regulated by the evacuation of a charge of fresh water.

integration [GEN] Recombination involving insertion of a genetic element.

integration by parts [MATH] A technique used to find the integral of the product of two functions by means of an identity involving another simpler integral; for functions of one variable the identity is

$$\int_a^b fg'dx + \int_a^b gf'dx = f(b)g(b) - f(a)g(a);$$

for functions of several variables the technique is tantamount to using Stokes' theorem or the divergence theorem.

integrator [ELECTR] **1.** A computer device that approximates the mathematical process of integration. **2.** *See* integrating network.

integrity [COMPUT SCI] Property of data which can be recovered in the event of its destruction through failure of the recording medium, user carelessness, program malfunction, or other mishap.

integrodifferential equation [MATH] An equation relating a function, its derivatives, and its integrals.

integument [ANAT] An outer covering, especially the skin, together with its various derivatives.

integumentary musculature [VERT ZOO] Superficial skeletal muscles which are spread out beneath the skin and are inserted into it in some terrestrial vertebrates.

integumentary pattern [ANAT] Any of the features of the skin and its derivatives that are arranged in designs, such as scales, epidermal ridges, feathers coloration, or hair.

integumentary system [ANAT] A system encompassing the integument and its derivatives.

intelligence [COMMUN] Data, information, or messages that are to be transmitted. [PSYCH] **1.** The intellect or astuteness of the mind. **2.** Ability to recognize and understand qualities and attributes of the physical world and of mankind. **3.** Ability to solve problems and engage in abstract thought processes.

intelligence quotient [PSYCH] The numerical designation for intelligence expressed as a ratio of an individual's performance on a standardized test to the average performance according to age. Abbreviated IQ.

intelligence test [PSYCH] A series of standardized tasks or problems presented to an individual to measure his innate capacity to think, conceive, or reason; examples are the Stanford-Binet test and the Wechsler-Bellevue intelligence test.

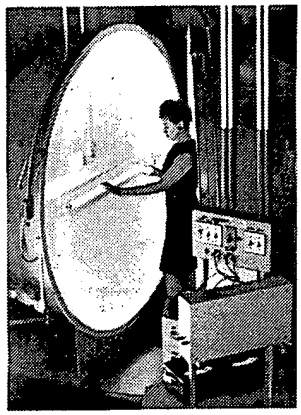
intelligent terminal [COMPUT SCI] A computer input/output device with its own memory and logic circuits which can perform certain operations normally carried out by the computer. Also known as smart terminal.

intelligibility [COMMUN] The percentage of speech units understood correctly by a listener in a communications system; customarily used for regular messages where the context aids the listener, in distinction to articulation. Also known as speech intelligibility.

intelligible crosstalk [COMMON] Crosstalk which is sufficiently understandable under pertinent circuit and room noise conditions that meaningful information can be obtained by more sensitive listeners.

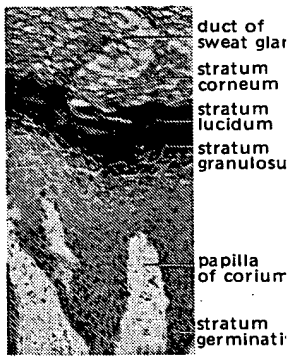
Intelsat [COMMUN] A satellite network under international control, used for global communication by more than 80 countries; the system requires stationary satellites over the Atlantic,

INTEGRATING-SPHERE PHOTOMETER



Uhlbricht sphere for measuring luminous flux and efficiency. *(Westinghouse Electric Corp.)*

INTEGUMENT



The characteristic strata of thick skin of the human fing as seen in cross section at hig magnification. *(From J. F. Nonidez and W. F. Windle, Textbook of Histology, McGraw-Hill, 1949)*

Vineyards photographs states, in relevant part, "[n]o rights are granted until timely payment is made." Greenfield Aff., Ex. A. The invoice contains a handwritten notation indicating "pd balance 1146.00 chk #18708 paid 5/15." Greenfield Aff., Ex. A. Plaintiffs therefore argue that the invoice did not become effective until May 15, 1996, and thus did not expire until May 15, 1997, a date later than the copyright registration date of April 25, 1997. Under these circumstances, Greenfield may be entitled to statutory damages and attorneys' fees pursuant to § 412.

Therefore, TVG's motion for summary judgment as to Plaintiffs' claims for statutory damages and attorneys' fees is granted as to the Whittingham photographs, the photographs displayed in the promotional brochures, and the four internegatives TVG supplied to M&M. TVG's motion for summary judgment as to Plaintiffs' claims for statutory damages and attorneys' fees with respect to the Vineyards photographs is denied.

Conclusion

For the reasons outlined above, the following orders shall be entered:

1. TVG's counterclaims against Plaintiffs shall be DISMISSED.

2. TVG's motion for summary judgment on Counts I (copyright infringement), II (Lanham Act), III (contract), and IV (*quantum meruit*) of Plaintiffs' complaint is DENIED, except that the Court finds that Plaintiffs shall not be entitled to statutory damages or attorneys' fees under 15 U.S.C. § 42 with respect to the Whittingham photographs, the photographs displayed in the promotional brochures, and the four internegatives TVG supplied to M&M.

3. Plaintiffs' claims against the Rods shall be DISMISSED, and the Rods shall be dismissed as defendants in this action. TVG's motion for summary judgment as to Count V of Plaintiffs' complaint is correspondingly GRANTED.

4. M&M's motion to dismiss Plaintiffs' complaint pursuant to F.R.C.P. 12(b)(1) and 12(h)(3) is DENIED.

5. Plaintiffs' motion for partial summary judgment as to Count I against TVG is GRANTED as to the photographs displayed at the Whittingham and Vineyards facilities, and DENIED as to the four internegatives TVG supplied to M&M.

6. Plaintiffs' motion for partial summary judgment as to Count III against TVG is DENIED.

7. Plaintiffs' motion for partial summary judgment as to Count I against M&M is GRANTED with respect to all relevant photographs except #051695-C-2.

8. Plaintiffs' motion for partial summary judgment as to Count III against M&M is GRANTED.

Resonate Inc. v. Alteon Websystems Inc.

U.S. Court of Appeals
Federal Circuit

Nos. 02-1201, -1225

Decided August 5, 2003

PATENTS

[1] Patent construction — Claims — Broad or narrow (§ 125.1303)

Patent construction — Claims — Defining terms (§ 125.1305)

Claim for method of processing client requests for resources from large World Wide Web site, in which multi-node Internet server performs step of "transmitting the requested resource to the client," does not require that data transmission path from selected server to client bypass "load balancer" used to service incoming client requests, since disputed claim language does not indicate whether requested data must be sent through load balancer or bypass it, since requirement that data bypass load balancer on its return trip to client cannot be inferred from inventor's failure to specify transmission path from server to client, since such requirement is not "natural consequence" of other limitations set forth earlier in claim, since fact that written description describes bypass feature as solution to prior art problem of potential bottleneck at load balancer does not, absent explicit claim language relating to bottleneck, require invention to include bypass feature, since limitation may not be read into claim from preferred embodiment, and since nothing in prosecution history warrants inclusion of bypass requirement.

[2] Patent construction — Claims — In general (§ 125.1301)

JUDICIAL PRACTICE AND PROCEDURE

Jurisdiction — Subject matter jurisdiction — In general (§ 405.0701)

Procedure — Judicial review — Appealability (§ 410.4603)

Patent infringement defendant's "cross-appeal," filed in response to plaintiff's appeal of federal district court's claim construction order, is dismissed, since defendant's filing, in essence, asks for advisory opinion as to construction of claim limitations that are not at issue in present appeal, and thus are not properly before appellate court.

Particular patents — Electrical — Internet server

5,774,660, Brendel, Kring, Liu, and Marino, World Wide Web server with delayed resource-binding for resource-based load balancing on a distributed resource multi-node network, judgment of noninfringement vacated and remanded.

Appeal from the U.S. District Court for the Northern District of California, Wilken, J.

Action by Resonate Inc. against Alteon Websystems Inc. for patent infringement. Plaintiff appeals from judgment of noninfringement. Vacated and remanded.

Robert P. Feldman, Elizabeth M. Saunders, Roger J. Chin, and Maura L. Rees, of Wilson Sonsini Goodrich & Rosati, Palo Alto, Calif., for plaintiff-appellant.

H. Mark Lyon, Jonathan C. Dickey, David A. Zonana, and Gillian Thackray, of Gibson, Dunn & Crutcher, Palo Alto, for defendant/cross-appellant.

Before Bryson, circuit judge, Plager, senior circuit judge, and Prost, circuit judge.

Plager, S.J.

Resonate Inc. owns U.S. Patent No. 5,774,660, entitled "World-Wide-Web Server with Delayed Resource-Binding for Resource-Based Load Balancing on a Distributed Resource Multi-Node Network." Resonate filed suit in the United States District Court for the Northern District of California against Alteon Websystems, Inc. alleging infringement of claim 6 of the '660 patent. The district court held a Markman hearing and entered a claim construction order. Thereafter, based on the court's interpretation of a particular limitation in claim 6, Resonate stipulated that it could not prevail on its claim of infringement, either literal or under the doctrine of equivalents. Subsequently, the district court entered final judgment of noninfringement in favor of Alteon. Because the trial court erred in its construction of the limitation at issue, we vacate the judgment and remand for further proceedings.

BACKGROUND

A.

The Internet is a global network connecting millions of computers in more than 100 countries. The World Wide Web, a collection of files, or 'web pages,' containing text, graphics, audio, and video, as well as 'hyperlinks' to other web pages, has become a central part of the Internet. Consumers typically access the web using client software applications known as web browsers that run on their personal computers.

Every web page is identified by a unique Uniform Resource Locator (URL). Web pages are stored on 'web sites,' locations on the World Wide Web comprising one or more computers, known as servers. Every web site has a home page, which is identified by a URL and is the first document users see when they first connect to the web site. Also associated with each web site is a domain name, usually part of the URL.

Each web server typically is identified by a unique 32-bit numeric address known as an Internet Protocol address, or IP address. When a user requests a web page by entering a URL into a browser, the URL is sent to a domain name system (DNS) server, which uses a look-up table to translate the domain name in the URL into the IP address of a server associated with the web site being accessed. That IP address is returned to the browser, which then uses the address to initiate a communications session with the server that contains the desired web page.

While smaller web sites may be served by a single computer, larger web sites that receive a large number of requests from clients (i.e., users accessing the web) may require

multiple computers acting as servers. Such a configuration is referred to as a 'server farm' or 'web farm.' If a web site resides on more than one server, a mechanism is needed for distributing client requests among the multiple servers so that no single server is overloaded. This process is referred to as 'load-balancing.' In a prior art approach described in the '660 patent, each server in a server farm contains a copy of the entire web site. Using a method known as 'round-robin load-balancing,' requests from users to access web pages on the web site are sent to the servers in a rotating fashion. This is implemented by including multiple IP addresses, one for each server, in the look-up table of the DNS server, and returning the IP addresses to clients in a round-robin fashion.

One drawback of round-robin load-balancing is that if one of the servers associated with a web site 'crashes,' clients will receive error messages when attempting to access the defective IP address of the crashed server because it may take several hours or even days before the defective IP address is removed from DNS server caches and browser caches, which temporarily store IP addresses. An alternative prior art solution, 'router-based load-balancing,' mitigates this problem by placing a router as an intermediary between browser clients and a web site's server farm. The IP address of the router is the only IP address available to DNS servers as the IP address corresponding to the web site. Thus all requests from client browsers to access the web site are sent to the router, which then uses an algorithm to determine which server in the server farm should service the request. The router retransmits the browser's request to the selected server, which transmits the requested file back to the router, which in turn retransmits the file to the browser. Each transmission is accomplished via a separately established connection.[1]

[1] In the context of the Internet, a 'connection' is not a physical one but instead is a logical circuit allowing for the exchange of information between two computers. The standard protocol suite used on the Internet is TCP/IP, named after the two main protocols included in the suite, TCP (Transmission Control Protocol) and IP (Internet Protocol). As already mentioned, the IP protocol provides the addressing scheme used on the Internet; it also specifies the format of data packets. The TCP protocol governs the exchange of information via TCP/IP packets necessary to establish a connection between two computers.

The '660 patent identifies two problems with the prior art router-based load-balancing approach. First, each server in a server farm must store a complete copy of the entire web site, i.e., the content must be mirrored. This implementation may be expensive, especially for certain web applications such as multimedia and video that consume large amounts of disk space. A second disadvantage of the router-based system is that all data transfers go through the router. When large amounts of data (e.g., video files) are sent from a server to a client browser through the router, a bottleneck may occur at the router and adversely affect system performance.

The invention described in the '660 patent, referred to as 'resource-based' or 'content-based' load-balancing, solves the first problem by distributing the web site's content among the servers. A router, also referred to in the patent as a load balancer, first determines what type of information the client is requesting and then selects a server to handle the request based on the content requested. The patent refers to this feature as 'delayed resource-binding.' As described in the preferred embodiment, a connection is first established between the client and the load balancer. Once the load balancer has selected the appropriate server, the connection is transferred to the server, and the server provides the requested file to the client.

In the preferred embodiment of the '660 patent, delayed resource-binding is accomplished by specific modifications to the TCP/IP protocol. The methodology disclosed as the preferred embodiment also solves the second problem identified in the prior art—the potential bottleneck at the router caused when large amounts of data are sent from the server to the client browser via the router. As described in the patent, the process permits data transmitted from the selected server back to the client to bypass the load balancer. This 'bypass' feature eliminates the bottleneck that might otherwise occur at the load balancer.

B.

The dispute between the parties centers on whether claim 6, the only claim at issue, by its terms *requires* the data transmission path from the selected server back to the client to bypass the load balancer. Claim 6 provides (emphasis added to highlight the disputed claim limitation):

6. A computer-implemented method of servicing requests for resources from a client by nodes containing different resources, the computer-implemented method comprising the steps of:

making a connection and setting up a session between the client and a load balancer at a web site for servicing requests from clients;

waiting for a URL request from the client once the load balancer has made the connection with the client;

receiving the URL request from the client and decoding the URL request to determine a requested resource;

comparing an identifier for the requested resource to identifiers for resources located on a plurality of nodes and determining a first subset of the plurality of nodes which contain the requested resource and a second subset of the plurality of nodes which do not contain the requested resource;

assigning the URL request to an assigned node in the first subset of the nodes which contain the requested resource, by determining the assigned node to be a server in the first subset of the nodes which is least busy processing requests, wherein the assigned node is not in the second subset;

transferring the connection and the session setup to the assigned node containing the requested resource by storing packets received from the client when establishing the connection and by transmitting the packets to the assigned node after the URL request is received;

reading the requested resource on the assigned node and *transmitting the requested resource to the client,*

whereby the assigned node is selected based on a location of the requested resource determined from the URL request and load balancing is performed among nodes having the requested resource and the connection is transferred from the load balancer to the assigned node by retransmitting the packets to the assigned node.

The key phrase "transmitting the requested resource to the client" lies at the heart of the dispute. The district court construed the phrase to mean "transmitting outbound data packets from the server directly to the client using the connection with the client which was transferred to the server, *causing the outbound data to bypass the load balancer.*" (Emphasis added.) In other words, the district court held that claim 6 requires the bypass feature.

In the accused devices, Alteon's Web Switch products running WebOS software, all data transmitted from the selected server to the client passes through the load balancer. Under the district court's construction, the accused devices could not infringe claim 6. Accordingly, the patentee Resonate stipulated that it could not prevail under the district court's construction of the disputed limitation; a judgment of noninfringement was entered.

Resonate timely appeals the final judgment entered by the district court. Alteon supports the district court's construction and judgment, and in addition has filed what it denominates as a cross-appeal. In its cross-appeal Alteon states that, in the event we disagree with the district court's construction of the phrase "transmitting the requested resource to the client," and the matter is returned to the district court for possible trial before a jury, we should "supplement" the court's construction of two additional limitations in claim 6—"making a connection" and "transferring the connection."

DISCUSSION

A.

The single issue raised on appeal by Resonate is the correctness of the district court's claim construction of the disputed phrase in claim 6. Claim construction is a matter of law over which we exercise independent review. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456 [46 USPQ2d 1169] (Fed. Cir. 1998) (en banc).

As always, we begin our claim construction analysis with the language of the claim. There is a "heavy presumption" that the terms used in claims "mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art." *Tex. Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1201 [64 USPQ2d 1812] (Fed. Cir. 2002). After identifying the ordinary meaning of a disputed claim term, we turn to the patent's written description and drawings to determine whether that meaning is incon-

sistent with the patentee's use of the term, *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 [60 USPQ2d 1851] (Fed. Cir. 2001), for example whether the patentee has specially defined the term or otherwise limited the scope of the claim. *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1344 [58 USPQ2d 1059] (Fed. Cir. 2001).

However, the written description is not a substitute for, nor can it be used to rewrite, the chosen claim language. Though understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment. *Electro Med. Sys., S.A. v. Cooper Life Scis., Inc.*, 34 F.3d 1048 [32 USPQ2d 1017] (Fed. Cir. 1994). In addition to the written description, prosecution history may be relevant to the claim construction process because statements made by a patentee during prosecution also may affect the scope of the claimed invention. *Rexnord*, 274 F.3d at 1343.

[1] The disputed language in claim 6—"transmitting the requested resource to the client"—specifies nothing regarding the transmission path over which the requested data must be sent. It merely requires the requested resource to be transmitted from the "assigned node" (the server identified as the "least busy processing requests" from among those that contain the requested resource) to the client that initiated the request. The limitation contains no language regarding the load balancer's involvement in the transmission of the requested resource to the client; by its terms, the limitation fails to specify whether data must pass through or bypass the load balancer. Thus, based on the plain language of the disputed limitation, any transmission path from the selected server to the client appears to be within the scope of claim 6. The question then becomes whether there is sufficient reason—in the other language contained in the claim, in the written description, or in the prosecution history—to read into the claim the further limitation that the data must bypass the load balancer on its return to the client.

The district court based its claim construction primarily on its observation that every other step of claim 6 is described in detail, including every interaction between the client, load balancer, and assigned server. From this, the court inferred that if the requested data passed through the load balancer on its way to the client, that step would have been detailed in the claim as well. Because the limitation simply requires the server to transmit the requested resource to the client, the district court held that the language implies that the load balancer is bypassed.

The district court's 'level of detail' analysis does not withstand close scrutiny. The patentee's apparent choice not to specify a transmission path from the server to the client led the district court to add a limitation that the requested resource be transmitted directly to the client. But patentees are not required to claim each part of an invention with the same amount of detail; indeed, such a rule likely would prove unworkable. Courts may not rewrite claim language based on what has been omitted from a claim, and the district court's attempt to do so here was legal error. *See K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1364 [52 USPQ2d 1001] (Fed. Cir. 1999) ("Courts do not rewrite claims; instead, we give effect to the terms chosen by the patentee."); *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 396 [155 USPQ 697] (Ct. Cl. 1967) ("Courts can neither broaden nor narrow the claims to give the patentee something different than what he has set forth.").

Alteon argues that the district court's reading of the plain language of the claim is correct when the claim is considered as a whole. According to Alteon, bypassing the load balancer is the natural consequence of other limitations set forth earlier in the claim. While it is true that a disputed claim limitation is construed in the context of other words and limitations in the claim, *see Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.*, No. 02-1145, 2003 WL 21488142, at *1 [67 USPQ2d 1132] (Fed. Cir. June 27, 2003), that canon of claim construction does not help Alteon here.

Most of the steps set out in claim 6 relate to the process of selecting a server based on the resource requested by the client. After the initial step of "making a connection" between the client and load balancer, the claim includes several steps detailing the server selection process, followed by the step of "transferring the connection" to the selected server. These steps constitute the 'delayed resource-

binding' aspect of the invention; a connection between the client and a server is not made until the load balancer determines which server should receive the client's request. Only the final step of claim 6 involves transmitting the requested resource back to the client.

The crux of Alteon's argument is that once the connection is transferred to the server, transmission of data from the server to the client must occur over that connection, and use of that connection must necessarily cause the data to bypass the load balancer. This line of reasoning is flawed. First, nothing in claim 6 requires that the requested resource be transmitted to the client using the transferred connection. Second, and the issue focused on by the parties, is that even if data transmitted from the server to the client uses the transferred connection, no language in the claim indicates that data transmitted via the transferred connection necessarily bypasses the load balancer.

Alteon fills in the missing language by arguing that a proper understanding of the term "connection" in the TCP/IP context requires that the transferred connection must bypass the load balancer. We agree with Resonate that Alteon's view is overly narrow for at least two reasons. First, as the district court correctly held, nothing in the language of claim 6 requires the connection to be defined in terms of TCP/IP. In holding that a connection is established by the exchange of information uniquely identifying the connection, the district court accepted a portion of Alteon's proposed construction, to which Resonate eventually acceded. The court, however, declined to restrict its construction to the specific unique information Alteon argues is required by a TCP connection.

Second, even if it is proper to consider the TCP/IP context when construing the term "connection," there is no basis for limiting the interpretation to the particular TCP connection Alteon proposes. As Resonate correctly points out, the written description of the '660 patent teaches that TCP/IP can be modified to achieve desired routing of data packets. Therefore, even if one interpreted the term "connection" in the context of TCP/IP, it would be improper to restrict the meaning to any particular implementation of TCP/IP. We conclude that the language of claim 6, both the disputed phrase and the other language of the claim, does not require data transmitted from the server to the client to bypass the load balancer.

The next question to be addressed is whether the written description limits the scope of the claim. Alteon argues that the written description establishes that the claimed invention must include the bypass feature to avoid the potential bottleneck at the load balancer when large files are transmitted from the server to the client via the load balancer. In support of its position, Alteon refers us to several passages in various parts of the written description, including the abstract, "Background of the Invention," and "Summary of the Invention" sections, all of which discuss the bottleneck problem. In response, Resonate cites portions of the written description, including a section entitled "Advantages of the Invention" and an overview of the inventive method in the "Summary of the Invention" section, from which any mention of bypass is conspicuously missing.

Alteon accuses Resonate of ignoring bypass as one of the main inventive features by selectively citing parts of the written description. Resonate responds by criticizing Alteon for focusing on the bypass feature to the exclusion of the other main aspect of the invention, arguing that the key novel feature of the invention is the delayed resource-binding, which allows for content-based load-balancing and eliminates the need to mirror content on the multiple servers comprising a web site's server farm. The bypass feature, Resonate contends, is an additional inventive aspect, not included within the particular terms of claim 6.

The issue at this point may be stated thus: when the written description sets out two different problems present in the prior art, is it necessary that the invention claimed, and thus each and every claim in the patent, address both problems? We conclude that on the record in this case, the answer is no. While not explicitly mentioning the prior art problem of having to store complete copies of the web site's content on multiple servers, claim 6 contains provisions that refer to the solution to this problem: the preamble language indicating that the nodes (servers) contain different resources, and the steps relating to the delayed resource-binding aspect of the invention. The claim does not, however, make any reference to the bottleneck problem or to the bypass so-

lution of that problem. Therefore, without explicit claim language relating to the bottleneck problem, we see no reason why the invention as recited in claim 6 must include the bypass feature described in the written description as a solution to that problem. *See Honeywell, Inc. v. Victor Co. of Japan*, 298 F.3d 1317 [63 USPQ2d 1904] (Fed. Cir. 2002) (holding that claimed invention did not need to solve both problems in the prior art when claim included language addressing only one problem).

Alteon also relies on the "Detailed Description" portion of the written description and the preferred embodiment contained therein for support of its position that claim 6 must include the bypass feature. It is undisputed that in the preferred embodiment of the '660 patent, data transmitted from the server to the client bypasses the load balancer. Indeed, the "Detailed Description" section contains a subsection entitled "Outgoing Data Bypasses Load-Balancer." However, as noted earlier, limitations may not be read into a claim from a preferred embodiment when the claim language is broader than that embodiment. *See Electro Med. Sys.*, 34 F.3d at 1054. In this case, claim 6 is broader than the preferred embodiment because, as discussed, there is no language in claim 6 relating to the bottleneck problem or the bypass solution of that problem. Therefore, we conclude that the bypass feature, though shown as part of the preferred embodiment and discussed in the written description as a solution to the potential bottleneck problem in the prior art, is not properly a limitation of claim 6.

Nor is this conclusion undercut by anything in the prosecution history. The only argument in that regard that Alteon makes is that the examiner required the inventors to combine both the steps of delayed load-balancing and transferring the connection before he allowed the patent to issue. Even if this statement is true, which Resonate disputes, it is irrelevant because the thrust of Alteon's argument stands on its contention that bypass is an inevitable result of transferring the connection, an argument we have rejected. Therefore, we see nothing in the prosecution history to alter our conclusion that claim 6 does not require that data, transmitted from the server to the client, bypass the load balancer.

B.

[2] Alteon filed what it denominated as a cross-appeal in this case. In the event this court concludes that further proceedings are required in the district court, Alteon asks that we "supplement" the district court's claim construction with respect to two other limitations in claim 6. Alteon notes that it does not disagree with the district court's basic construction of the phrases at issue in these other two limitations, but believes it would be helpful if we would provide a "refinement" of the district court's work. On its face, this is not a cross-appeal. We agree with Resonate that the cross-appeal must be dismissed, and Alteon's reply brief based on its cross-appeal stricken from the record.

The question of whether a cross-appeal is properly before us implicates our jurisdiction to decide the issues raised in the cross-appeal. No cross-appeal is needed in order for a prevailing party to present any legitimate argument in support of the judgment below, even if the argument was rejected or ignored by the trial court. As we pointed out in the court's Order in *Bailey v. Dart Container Corp. of Michigan*, 292 F.3d 1360, 1362 [63 USPQ2d 1319] (Fed. Cir. 2002), a cross-appeal is necessary and appropriate only when a party seeks to enlarge its own rights under the judgment under review, or to lessen the rights of its adversary under the judgment. Here Alteon's base case is in support of the judgment as issued; its "cross-appeal" is a suggestion that, should it fail in that effort, it would like us to render an advisory opinion regarding matters not properly before us. This we may not do. (As it turns out, we necessarily addressed at least in part the matter Alteon attempted to raise. In our earlier discussion we considered the impact of construing the "transmitting" limitation in the context of the claim as a whole, and concluded that the district court correctly declined to restrict any part of claim 6, including the "making a connection" and "transferring the connection" limitations, to the TCP/IP context.)

We have considered the parties' other arguments, and find them to be unpersuasive or unnecessary for resolution of this appeal.

CONCLUSION

For the foregoing reasons, we hold that the district court erred in construing the limitation "transmitting the requested resource to the client" in claim 6 to require that data transmitted from the server to the client must bypass the load balancer. Accordingly, we vacate the district court's judgment of noninfringement

of the '660 patent, and remand for further proceedings not inconsistent with this opinion.

VACATED and REMANDED

In re MBNA America Bank N.A.

U.S. Court of Appeals
Federal Circuit
No. 02-1558
Decided August 15, 2003

TRADEMARKS AND UNFAIR TRADE PRACTICES

[1] Registration and its effects — Nonregistrable subject matter — Descriptive; deceptively misdescriptive (§ 315.0407)

Types of marks — Descriptive — Particular marks (§ 327.0303)

Substantial evidence supports conclusion that applicant's "Montana Series" and "Philadelphia Card" marks are merely descriptive of applicant's services, since those services are properly characterized as "affinity" credit card services, in that applicant offers, advertises, and provides credit cards depicting subject matters appealing to groups with various geographic affinities, since marks at issue immediately convey to consumers information about specific regional affinity, or user group to which applicant's services are directed, and since marks thus are merely descriptive of significant feature or characteristic of affinity credit card services, namely, feeling of pride in identification with specific regional location.

[2] Types of marks — Suggestive — In general (§ 327.0401)

Types of marks — Arbitrary or fanciful — In general (§ 327.0801)

Regional designation can be inherently distinctive if it is not generic, or does not describe feature or characteristic of goods or services for which designation is used; in present case, however, applicant's "Montana Series" and "Philadelphia Card" marks were properly denied registration on ground that they are merely descriptive, in that they provide information designating specific regional affinities for applicant's "affinity" credit card services.

[3] Types of marks — Descriptive — In general (§ 327.0301)

Descriptiveness of trademark must be determined in relation to specific goods or services for which registration is sought; in present case, Trademark Trial and Appeal Board's finding that applicant's "Montana Series" and "Philadelphia Card" marks are merely descriptive was properly based on "affinity" credit card services offered by applicant, not on picture designs on cards or on advertising, although applicant's advertising materials that promote association of its credit card services with geographical affiliation are relevant to determination of descriptiveness.

[4] Types of marks — Descriptive — In general (§ 327.0301)

Trademark Trial and Appeal Board did not employ impermissible "purchaser motivation" test in determining that applicant's "Montana Series" and "Philadelphia Card" marks are merely descriptive of applicant's "affinity" credit card services, since, to extent board discussed reason for consumer's selection of particular credit card, it was part of board's analysis of public perception of words and images appealing to regional affinities, which led to board's finding that words in marks describe features or characteristics of affinity credit card services; mere description of such feature or characteristic cannot be registered as trademark.

Appeal from the U.S. Patent and Trademark Office, Trademark Trial and Appeal Board.

Applications of MBNA America Bank N.A. for registration of "Montana Series" and "Philadelphia Card" as service marks (serial nos. 74/417,538 and 74/472,908). Applicant appeals from decision upholding examining attorney's final refusal of registration. Affirmed; Mayer, C.J., dissenting in separate opinion.

Michael A. Grow and Evan S. Stolove, of Arent Fox Kintner Plotkin & Kahn, Washington, D.C., for appellant.

Linda Moncys-Isacson, associate solicitor, John M. Whealan, solicitor, and Thomas Krause and Nancy C. Slutter, associate solici-

domain.") (internal quotation and citation omitted). Although a descriptive word may assume trademark status through the accumulation of secondary meaning in the minds of the consuming public, *Western Publishing Co. v. Rose Art Indus.*, 910 F.2d 57, 60 [15 USPQ2d 1545] (2d Cir. 1990), any claim to a right to prevent the use of similar but different words is weakened by the established concurrent use of similar descriptive words by competitors. *See Gruner + Jahr USA Publishing v. Meredith Corp.*, 991 F.2d 1072, 1078 [26 USPQ2d 1583] (2d Cir. 1993); *W.E. Bassett Co. v. Revlon, Inc.*, 354 F.2d 868, 871 [148 USPQ 170] (2d Cir. 1966) ("[T]he law does not favor trademark monopolization of such descriptive terms."). Several other dictionary publishers, including Random House, have used the adjective "College" or "University" to describe their dictionaries. Several also have attached the generic term "Webster's" to their dictionaries. Merriam-Webster's own evidence was that "college" is used to describe the pertinent genre of dictionaries. No publisher (including Merriam-Webster) uses the precise phrase "Webster's Collegiate." Whatever Merriam-Webster's rights in that phrase, the general and prolonged use of "Webster's" and "college" by other publishers negates as a matter of law any claim that Random House's combined use of those words diluted those rights, if any.

CONCLUSION

For the foregoing reasons, we reverse, vacate the district court's injunction, and direct the dismissal of Merriam-Webster's complaint. In light of our disposition of the underlying action, we need not address the various forms of other relief sought by the parties.

U.S. Court of Appeals
Federal Circuit

Electro Medical Systems S.A. v. Cooper Life Sciences Inc.

No. 94-1003

Decided September 12, 1994

PATENTS

1. Patentability/Validity — Anticipation — Identity of elements (§115.0704)

Claim for tooth cleaning device which delivers air, abrasive, and liquid to tooth surface as continuous liquid "curtain" surrounding pressurized jet of abrasive-laden gas was not anticipated by prior patent for blasting and spraying gun that does not disclose substantially unpressurized flow of liquid or continuous liquid curtain, even though prior art device could allegedly be set to any water pressure, since mere fact that certain outcome may result from given set of circumstances is insufficient to prove anticipation, and since it has not been shown that unpressurized flow is necessarily present in prior art device, and that it would be so recognized by persons of ordinary skill.

2. Infringement — Construction of claims (§120.03)

Patent construction — Claims — Defining terms (§125.1305)

Claims for tooth cleaning device having first nozzle means for delivering abrasive-laden stream to point of use and second nozzle means positioned to deliver stream of liquid "adjacent said point of use" do not, in view of prosecution history and specification, require second nozzle means to deliver liquid to tooth surface as stream separate and independent from abrasive-laden stream, and claims thus cover accused device that delivers combined air, abrasive, and liquid stream to target area; similarly, claim reciting dental handpiece with two fluid discharge orifices positioned so that streams of abrasive-laden gas and liquid converge toward each other does not require that two streams converge at or near surface of tooth, and thus covers device which causes streams to converge before contact with tooth surface.

3. Infringement — Construction of claims (§120.03)

Patent construction — Claims — Defining terms (§125.1305)

Claim for tooth cleaning device employing "water soluble" abrasive particles, and claim reciting device for effecting abrasion including means for releasing substantially unpressurized flow of liquid as "continuous liquid curtain" surrounding pressurized jet of particle-laden gas, are both infringed by accused device, even though accused infringer contends device does not emit "solid" curtain of liquid and uses abrasive particles with insoluble coating that dissolve only on contact with tooth, since claims, in view of specification and prosecution history of patent and evidence and testimony presented at trial, are properly construed to require neither "solid" liquid curtain nor abrasive parti-

cles which dissolve prior to contact with tooth.

4. Infringement — Willful (§120.16)

REMEDIES

Monetary — Damages — Patents — Increased damages (§510.0507.07)

Monetary — Attorney's fees; costs — Patents — Exceptional case (§510.0905.03)

Federal district court erred by concluding, based on infringer's failure to produce exculpatory opinion of counsel and its six-year delay in entering U.S. market after obtaining counsel, that infringement must have been willful, since, even if infringer had unfavorable counsel opinion, its decision to defer sale of accused product under circumstances presented was more consistent with satisfying duty of due care to avoid or minimize infringement than with willfulness, and since infringer's claims of patent invalidity and non-infringement were not without merit; court's award of attorney's fees and enhanced damages thus constituted abuse of discretion, since court expressly declined to find misconduct or copying by infringer.

Particular patents — General and mechanical — Tooth cleaning

3,882,638, Black, air-abrasive prophylaxis equipment, infringed and not invalid.

3,972,123, Black, air-abrasive prophylaxis equipment, infringed and not invalid.

4,412,402, Gallant, equipment and method for delivering an abrasive-laden gas stream, infringed and not invalid.

Appeal from the U.S. District Court for the Eastern District of New York, Caden, J.

Action by Electro Medical Services S.A. against Cooper Life Sciences Inc., Dentsply International Inc. and Dentsply Research & Development Corp., for declaratory judgment of patent invalidity and non-infringement, in which Dentsply International Inc. and Dentsply Research & Development Corp. counterclaim for patent infringement. From judgment for defendants on counterclaim and award of double damages and attorney's fees against plaintiff for willful infringement, plaintiff appeals. Affirmed in part and reversed in part.

Preston Moore, Grant L. Kim, and James R. Shay, of Morrison & Foerster, San Francisco, Calif. for appellant.

Dale M. Heist, Albert W. Preston Jr. and John P. Donohue Jr., of Woodcock, Washburn, Kurtz, Mackiewicz and Norris, Philadelphia, Pa.; Thomas R. Boland and Ellen A. Efros, of Vorys, Sater, Seymour & Pease, Washington, D.C.; and Edward J. Hanson Jr., Dentsply International Inc., for appellees.

Before Mayer, Lourie, and Rader, circuit judges.

Lourie, J.

Electro Medical Systems, S.A. ("EMS") appeals from a judgment of the United States District Court for the Eastern District of New York holding U.S. Patents 3,882,638, 3,972,123, and 4,412,402 infringed and not invalid, and awarding increased damages and attorney fees based on its finding of willful infringement. *Electro Medical Sys., S.A. v. Cooper Life Sciences, Inc.*, Civ. Action No. CV-86-0607 (E.D.N.Y. Aug. 25, 1993) (final judgment order).[1] We affirm-in-part and reverse-in-part.

BACKGROUND

The three patents in suit[2] relate to equipment for delivering gas, abrasive, and liquid to the surface of a tooth in order to remove plaque and stain without damaging the tooth surface. The devices claimed in the '638 and '123 patents direct a stream of abrasive–laden gas to a tooth surface and a stream of liquid to the tooth surface adjacent to the target area of the abrasive-laden gas stream. After the abrasive particles impact the tooth, they are taken up by the liquid and then removed in suspension form through the use of a common suction tube. The '402 patent relates to an improved device using abrasive particles that are water soluble, wherein the device delivers air, abrasive, and liquid to a tooth surface as a continuous liquid "cur-

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[1] The final judgment order dated August 25, 1993 is based on a memorandum and order dated August 26, 1992 ("*Electro* I"), a memorandum and order on reconsideration dated May 13, 1993 ("*Electro* II"), and a memorandum and order on reconsideration dated August 6, 1993 ("*Electro* III").

[2] The '638 and '123 patents, both entitled "Air-Abrasive Prophylaxis Equipment," issued in 1975 and 1976, respectively, naming Dr. Robert Black as inventor. The '402 patent, entitled "Equipment and Method for Delivering an Abrasive-Laden Gas Stream," issued in 1983, naming Ben J. Gallant as inventor.

tain" surrounding a pressurized jet of abrasive-laden gas.

Appellant EMS is a Swiss manufacturer of dental equipment, distributing products in over fifty different countries. In 1984, EMS filed suit against appellees Cooper Life Sciences Incorporated, Dentsply International Incorporated, and Dentsply Research & Development Corporation (collectively "Dentsply") in the Northern District of Illinois, seeking a declaratory judgment of invalidity and non-infringement of patents relating to air abrasive equipment used to clean teeth, including those at issue here. The '638 and '123 patents are owned by Cooper and exclusively licensed to Dentsply. The '402 patent is owned by Dentsply.

Despite EMS's allegations that Dentsply had asserted foreign counterpart patents against EMS and its distributors and had threatened to sue potential United States distributors of EMS's products, Dentsply moved to dismiss for lack of a justiciable controversy. Dentsply contended that it did not intend to charge EMS with infringement of the U.S. patents and that EMS lacked the capacity and intent to sell its products in the United States. The Northern District of Illinois denied Dentsply's motion to dismiss.

In 1986, on motion of the defendants, the Illinois court transferred the claims against Cooper to the Eastern District of New York for reasons of convenience, and severed and stayed the claims against Dentsply because Dentsply had no "presence" in New York. Subsequently, Dentsply was allowed to join the New York action because it by then had acquired rights to Cooper's patent.

Dentsply then initiated an International Trade Commission (ITC) proceeding against EMS and others for alleged patent infringement. After discovery was nearly completed, Dentsply moved to dismiss its ITC claims against EMS, which the ITC did, with prejudice.

In November of 1987, Dentsply again moved to dismiss the district court action, claiming that there was no justiciable controversy. As part of its motion, Dentsply noted that

> [at a status conference in September of 1987, the magistrate] strongly recommended that, if EMS truly were interested in a determination of the issues of patent validity and infringement, EMS undertake sufficient acts in the United States to create an actual controversy. [The magistrate] made clear his view that, absent at least one sale by EMS in the United States, the court would dismiss the infringement issue for lack of subject matter jurisdiction. Obviously, the same conclusion applies to the issue of patent validity.

Mem. of Points and Auth. of Def. in Support of Motion to Dismiss. The court again denied Dentsply's motion.

In 1990, six years after commencement of this litigation, after the completion of discovery and three months before the scheduled trial, Dentsply threatened to bring a third motion to dismiss for lack of a justiciable controversy. In response, EMS sold six products. Dentsply then amended its answer to add a counterclaim for patent infringement, alleging that EMS was a willful infringer. EMS stipulated in a pretrial order that it "[would] not waive any claim of attorney-/client privilege in defense of any allegation of willful infringement or demand for counsel fees." Invoking the privilege at trial, EMS declined to disclose the substance of any advice it received from its counsel prior to the United States sales.

After a full bench trial, the court issued a decision finding all of the claims in suit to be infringed and not invalid, and awarding $ 8,752.00 in compensatory damages based on EMS's six sales. Drawing an adverse inference from EMS's refusal to produce an opinion of counsel, the court found that EMS was a willful infringer, and awarded double damages and $ 942,528.90 in attorney fees. The award was affirmed on reconsideration. EMS appeals from the judgment of validity and infringement and from the award of increased damages and attorney fees.

DISCUSSION

1. *Validity*

At trial, EMS challenged the validity of claim 20 of the '402 patent on the basis that it was anticipated by U.S. Patent 2,405,854 to Ruemelin under 35 U.S.C. § 102(b). Anticipation must be proved by clear and convincing evidence. *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 632, 2 USPQ2d 1051, 1053 (Fed. Cir.), *cert. denied*, 484 U.S. 827 (1987). Anticipation under 35 U.S.C. § 102(b) requires the presence in a single prior art disclosure of each and every element of a claimed invention, *Lewmar Marine, Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 USPQ2d 1766, 1767 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1007 (1988), and is a question of fact subject to review under the clearly erroneous standard, *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1574, 227 USPQ 177, 179 (Fed. Cir. 1985).

The court determined that EMS had failed to introduce clear and convincing evidence that the Ruemelin patent discloses every element of claim 20. Specifically, the court found that the Ruemelin patent did not disclose a substantially unpressurized flow of liquid or a continuous liquid curtain surrounding the pressurized jet of particle-laden gas. *Electro* I, slip op. at 55. EMS asserts that these features are "inherent" in the Ruemelin patent because, although Ruemelin discloses a blasting and spraying gun utilizing pressurized liquid, the Ruemelin device "could be set to any water pressures."

[1] We do not agree that the subject matter of the claim was anticipated. "The mere fact that a certain thing *may result* from a given set of circumstances is insufficient to prove anticipation." *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268-69, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991) (quoting *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981)) (emphasis added). EMS was required to prove that an unpressurized flow is necessarily present in the Ruemelin disclosure, and that it would be so recognized by persons of ordinary skill. *Id.* at 1268, 20 USPQ2d at 1749. EMS did not discharge its burden; thus, the district court properly concluded that EMS failed to prove invalidity of claim 20.

EMS also challenged the validity of claims 4, 12, 16, and 21 of the '402 patent on the basis that the subject matter of the claims would have been obvious under 35 U.S.C. § 103. Obviousness is a question of law, based on underlying factual inquiries, which are subject to the clearly erroneous standard of review. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568-69, 1 USPQ2d 1593, 1597-98 (Fed. Cir.), *cert. denied*, 481 U.S. 1052 (1987). In a thorough opinion, the magistrate undertook an analysis of the obviousness question, carefully considering the scope and content of the prior art, the differences between the claims and the prior art, the level of ordinary skill in the art, and objective evidence of non-obviousness, including long-felt but unsatisfied need, failure of others, commercial success, copying, and tribute by others. *See Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). The court concluded that EMS had not met its burden of demonstrating by clear and convincing evidence that the claimed subject matter would have been obvious to one of ordinary skill in the art.

EMS does not challenge the court's underlying findings here; rather, it merely asserts that "if [the claims] were construed for validity as the district court construed [them] for infringement[, they would be] invalid under 35 U.S.C. § 103." We have considered this assertion and find it unpersuasive. EMS has not convinced us of reversible error in the court's determination that the '402 patent is not invalid.

2. *Infringement*

The court found that the accused EMS device infringed claims 2 and 3 of the '638 patent, claim 4 of the '123 patent, and claims 4, 12, 16, 20, and 21 of the '402 patent. EMS asserts that the judgment of infringement with respect to the '638 and '123 patents was based on erroneous claim interpretation. With respect to the '402 patent, EMS asserts that the judgment of infringement was based on erroneous claim interpretation and clearly erroneous fact finding.

A determination of patent infringement requires a two-step analysis. First, a claim must be interpreted to determine its scope and meaning; second, it must be determined whether an accused device is within the scope of the properly interpreted claim. *ZMI Corp. v. Cardiac Resuscitator Corp.*, 844 F.2d 1576, 1578, 6 USPQ2d 1557, 1559 (Fed. Cir. 1988). The first step is an issue of law, reviewed *de novo*, and the second is a question of fact, reviewed for clear error. *Minnesota Mining & Mfg., Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1570, 24 USPQ2d 1321, 1330 (Fed. Cir. 1992). "A finding is 'clearly erroneous' when although there is evidence to support it, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed." *United States v. United States Gypsum Co.*, 333 U.S. 364, 395 (1948).

Claim 2 of the '638 patent is directed to a system for handling and feeding abrasive particles, and recites a "first nozzle means for delivering the abrasive-laden stream to a point of use" and a "*second nozzle means* in predetermined relation to the first nozzle means *for delivering a stream of liquid adjacent said point of use*," the first and second nozzle means being integrated in a common handpiece.[3] Claim 4 of the '123 patent

[3]In its entirety, with relevant portions of its parent claim added, claim 2 reads:

> [A system for handling and feeding abrasive particles comprising means for mixing abrasive particles with a gaseous stream, first nozzle means for delivering the abrasive laden stream to a point of use, controllable supply means for starting and stopping the abrasive laden stream, second nozzle means in predetermined relation to the first nozzle means for delivering a stream of liquid adjacent said point of use, controllable supply means for starting and

recites a dental handpiece for use in the cleaning of teeth, and includes "two fluid discharge orifices . . . being positioned and oriented to discharge streams of the abrasive-laden gas and liquid in the same general direction transversely of the hand grip, *with the streams of abrasive-laden gas and liquid converging toward each other.*"[4]

EMS argues that the "second nozzle means" of the '638 claims must deliver a stream of liquid to the tooth surface as a stream *separate and independent* from the abrasive-laden stream delivered by the first nozzle means, which is different from the accused device. Furthermore, EMS argues that the '123 claim only covers a device in which the streams of liquid and abrasive-laden gas converge *at or near the surface of the tooth*, unlike the accused device. EMS relies upon the specifications, which it asserts disclose devices consistent with its asserted claim interpretation. Also, EMS points to the prosecution history of the '638 patent, in which the patentee emphasized that the "nozzle means provid[es] for delivery of the stream of liquid to a point adjacent to the point to which the abrasive is directed," and to the prosecution history of the '123 patent, in which the "convergence" of the streams was emphasized.

Because the EMS device delivers a combined stream of gas, particles, and liquid to the tooth surface, EMS asserts that the device does not infringe the '638 patent as EMS interprets the claims. Furthermore, EMS contends that the accused device delivers streams that converge at the edge of a first nozzle, immediately after discharge and before contact with the tooth's surface, and thus it does not infringe the '123 patent. Dentsply contends that the court properly interpreted the claims and properly found infringement.

Claims speak to those skilled in the art. *See Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 986, 6 USPQ2d 1601, 1604 (Fed. Cir. 1988). When the meaning of words in a claim is in dispute, the specification and prosecution history can provide relevant information about the scope and meaning of the claim. *Id.* at 986, 6 USPQ2d at 1604. However, claims are not to be interpreted by adding limitations appearing only in the specification. *See Intervet Am. v. Kee-Vet Lab.*, 887 F.2d 1050, 1053, 12 USPQ2d 1474, 1476 (Fed. Cir. 1989) ("No matter how great the temptations of fairness or policy making, courts do not rework claims. They only interpret them.") (quoting with approval *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 395-96, 155 USPQ 697, 701 (Ct. Cl. 1967)). Thus, although the specifications may well indicate that certain embodiments are preferred, particular embodiments appearing in a specification will not be read into the claims when the claim language is broader than such embodiments. *See Specialty*, 845 F.2d at 987, 6 USPQ2d at 1605 ("Where a specification does not *require* a limitation, that limitation should not be read from the specification into the claims.").

[2] Upon review of the two specifications and prosecution histories, we conclude that the court did not err when it determined that the term "adjacent" does not necessarily mean "separate and independent." The '638 claim was properly interpreted to cover a device that delivers a combined air, abrasive, and liquid stream surrounded by a liquid stream such that the abrasive is delivered to a target area on the tooth surface and liquid is delivered adjacent that area. Similarly, the court properly concluded that the term "converge" does not necessarily mean "converge at the surface of the tooth," and that the claims were properly interpreted to cover a device having streams converging before they reach the tooth surface. The prosecution history does not indicate otherwise. We thus see no error in the court's interpretation of the claims of the '638 and '123 patents and hence its infringement determination.

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stopping the stream of liquid and control means for the supply means including means providing for substantially concurrently starting and stopping of the discharge of the gaseous and liquid streams from the nozzle means,] in which the first and second nozzle means are integrated in a common handpiece.

Claim 3 contains the following relevant language: second nozzle means for receiving heated water from the water heater and for delivering a stream of heated water substantially to said point of use . . . .

[4] In its entirety, claim 4 reads:

A dental handpiece for use in the cleaning of teeth, the handpiece comprising an elongated hand grip having two separate fluid passages extended longitudinally therethrough providing respectively for supply of abrasive laden gas and of a liquid, the hand grip further having a head at one end thereof with two fluid discharge orifices and with two passages respectively and separately connecting said longitudinal passages with the fluid discharge orifices, the orifices being positioned and oriented to discharge streams of the abrasive laden gas and liquid in the same general direction transversely of the hand grip, with the streams of abrasive laden gas and liquid converging toward each other.

Claims 4 and 20 are representative of the claims at issue in the '402 patent. Claim 4 recites a method for effecting abrasion using "water soluble" particles.[5] Claim 20 recites a device for effecting abrasion including "means for releasing a substantially unpressurized flow of [] liquid as a *continuous liquid curtain* surrounding [a] pressurized jet of particle-laden gas."[6] EMS argues that neither the "water soluble" nor the "continuous liquid curtain" limitation is satisfied by the accused device.

EMS contends that the meaning of the term "water soluble," as used in the patent, requires that under actual operating conditions the particles dissolve immediately upon contact with the water before hitting the tooth. EMS further contends that the "means for releasing liquid as a liquid curtain" must create a "solid" curtain of liquid at the point the water is released. EMS maintains that the court clearly erred in determining that the abrasive particles used by the EMS device were soluble within the meaning of the claims because they include an insoluble coating that "cracks" upon impact with the tooth so that the particles will dissolve only at the tooth's surface. EMS further maintains that the court clearly erred in determining that the EMS device includes a "means for releasing liquid as a liquid curtain" as that phrase is properly interpreted.

[3] Upon review of the '402 specification and prosecution history, we conclude that the court properly construed the claims as not requiring that the particles used be soluble within the area between the nozzle and the tooth and as not requiring that the curtain of water be a "solid" curtain. *See Specialty*, 845 F.2d at 981, 6 USPQ2d at 1601; *Intervet*, 887 F.2d at 1050, 12 USPQ2d at 1474.

The court's findings of infringement of the '402 patent were based primarily on expert testimony and experiments conducted during the trial. As the court noted, EMS "performed *no* tests[, with the exception of an unreliable courtroom demonstration,] to rebut the findings made by Dentsply's expert. [EMS's] lack of 'hard' evidence . . . and the plethora of opinion testimony unsupported by any backup evidence, [were] largely unpersuasive." *Electro* I, slip op. at 18-19. Based on the expert testimony and experiments, the court found that the particles used in the EMS device were indeed soluble within the meaning of the claims and that "[t]he inner combined spray emitted from the EMS products' nozzle is surrounded by a water curtain." We conclude that EMS has not shown the court's claim interpretation to be in error or its infringement findings to be clearly erroneous.

3. *Increased Damages and Attorney Fees*

After determining that the accused device infringed Dentsply's patents, the court assessed actual damages of $ 8,752.00 resulting from the six sales in 1990. The court drew an adverse inference from EMS's refusal to produce an opinion of counsel, stating

> Based upon EMS' refusal to disclose the substance of the opinion of its counsel, despite Dentsply's charge of willful infringement, as well as EMS' failure to enter the U.S. market for six years after obtaining counsel, the court concludes that it must draw an adverse inference that the opinion was unfavorable. EMS eventually proceeded with knowledge of the unfavorable view of counsel, and thus engaged in willful infringement of the patents.

Electro I, slip op. at 79. The court thus held that the infringement was willful, awarding increased damages and $942,528.90 in attorney fees. On reconsideration of the award, the court affirmed. *Electro* II, slip op. at 20. After the original and reconsideration orders were issued, EMS offered to waive the attorney-client privilege and disclose the advice of its counsel. The district court declined EMS's offer as untimely.

EMS argues that the award of increased damages and attorney fees must be reversed because it is based on a clearly erroneous finding of willfulness. Dentsply asserts that

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[5]With relevant portions of its parent claim added, claim 4 reads:

> [A method for effecting abrasion comprising delivering from a nozzle orifice a pressurized jet of particle-laden gas, with resultant development of an ambient induction zone, releasing a substantially unpressurized flow of the liquid into an annual space surrounding the ambient induction zone and thereby establish a combined stream of gas, particles and liquid, and directing the combined stream against the surface to be abraded,] in which the particles are water soluble and the liquid is water.

[6]Claim 20 reads:

> Equipment for effecting abrasion comprising: nozzle means for delivering a pressurized jet of gas laden with particles, with resultant development of an ambient induction zone, and means for delivering a liquid into said induction zone comprising means for releasing a substantially unpressurized flow of the liquid as a continuous liquid curtain surrounding the pressurized jet of particle-laden gas.

the court properly awarded such damages and argues that "EMS could have avoided willfulness and ... attorney fees ... had they shown conviction in their case by either selling the product or by waiving privilege." We agree with EMS.

In appropriate cases, a patentee may recover from an infringer increased damages and attorney fees. 35 U.S.C. §§ 284, 285 (1988); *General Motors Corp. v. Devex Corp.*, 461 U.S. 648, 654 (1983). The decision whether to award increased damages or attorney fees is reviewed for an abuse of discretion. *SmithKline Diagnostics, Inc. v. Helena Lab. Corp.*, 926 F.2d 1161, 1165 n.2, 17 USPQ2d 1922, 1925 n.2 (Fed. Cir. 1991). Such awards have been made when the infringement was found to be willful. *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 826, 23 USPQ2d 1426, 1435 (Fed. Cir. 1992).

Willfulness is shown when, upon consideration of the totality of the circumstances, clear and convincing evidence establishes that the infringer acted in disregard of the patent, that the infringer had no reasonable basis for believing it had a right to engage in the infringing acts. *See American Medical Sys. Inc. v. Medical Eng'g Corp.*, 6 F.3d 1523, 1530, 28 USPQ2d 1321, 1325 (Fed. Cir. 1993), *cert. denied*, 114 S. Ct. 1647 (1994). The existence of willful infringement is a finding of fact, which will not be disturbed on appeal unless it is clearly erroneous. *Id.* at 1530, 28 USPQ2d at 1325.

The law imposes an affirmative duty of due care to avoid infringement of the known patent rights of others. *L.A. Gear Inc. v. Thom McAn Shoe Co.*, 988 F.2d 1117, 1127, 25 USPQ2d 1913, 1920 (Fed. Cir.), *cert. denied*, 114 S. Ct. 291 (1993). Usually, this duty includes seeking and obtaining competent legal advice before engaging in activity that may result in infringement. *Underwater Devices, Inc. v. Morrison-Knudsen Co.*, 717 F.2d 1380, 1389-90, 219 USPQ 569, 576 (Fed. Cir. 1983). Accordingly, we have held that when an infringer refuses to produce an exculpatory opinion of counsel in response to a charge of willful infringement, an inference may be drawn that either no opinion was obtained or, if an opinion was obtained, it was unfavorable. *See, e.g., Fromson v. Western Litho Plate & Supply Co.*, 853 F.2d 1568, 1572-73, 7 USPQ2d 1606, 1611 (Fed. Cir. 1988); *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 1579-80, 230 USPQ 81, 91 (Fed. Cir. 1986), *cert. denied*, 479 U.S. 1034 (1987). However, there are no hard and fast rules in respect of willfulness. *Rolls-Royce Ltd. v. GTE Valeron Corp.*, 800 F.2d 1101, 1109, 231 USPQ 185, 191 (Fed. Cir. 1986); *Studiengesellschaft Kohle, M.B.H. v. Dart Indus.*, 862 F.2d 1564, 1573, 9 USPQ2d 1273, 1282 (Fed. Cir. 1988) ("The consequences of a finding of willful infringement being serious, such a finding ... is to be made only after due consideration of the totality of the circumstances."). An inference that an opinion was unfavorable does not foreclose consideration of other relevant factors. Possession of a favorable opinion of counsel is not essential to avoid a willfulness determination; it is only one factor to be considered, albeit an important one. *Kloster*, 793 F.2d at 1579, 230 USPQ at 91 (though it is an important consideration, the absence of an opinion of counsel alone does not mandate an ultimate finding of willfulness).

EMS had a right to assert the attorney-client privilege. *See Quantum Corp. v. Tandon Corp.*, 940 F.2d 642, 644 (Fed. Cir. 1991) (attorney-client privilege is a "basic, time-honored privilege [warranting] careful consideration."). As we previously have noted,

> [a]n accused infringer ... should not, without the trial court's careful consideration, be forced to choose between waiving the privilege in order to protect itself from a willfulness finding, in which case it may risk prejudicing itself on the question of liability, and maintaining the privilege, in which case it may risk being found to be a willful infringer if liability is found.

Id. (suggesting that court inspect *in camera* privileged communications to determine if separate trial on willfulness issue is appropriate).[1] Assertion of the privilege does not raise an irrebuttable presumption of willfulness. Such a rule would not accommodate consideration of other facts, nor would it respect the right of a party to assert the privilege.

[4] The district court here was free to draw an inference adverse to EMS when, asserting the attorney-client privilege, EMS refused to produce an opinion of counsel. However, the court erred because it failed to consider the evidence in its entirety and erroneously evaluated the significance of EMS's six-year delay in entering the market.

The district court reasoned that EMS's decision to wait six years before it sold the accused product supported the inference that EMS possessed an unfavorable opinion of counsel. This suggests that EMS was pursu-

[1] In the present case, no motion was made to sever liability from damages.

ing protracted litigation and running up large fees to the detriment of its opponents, while believing that it had a losing case and before it infringed. If that were true, such conduct could have been dealt with by sanctions for bad-faith litigation or even dismissal for lack of a case or controversy, but it would not have been willful infringement. There was no finding of misconduct in this case, nor did the district court choose to dismiss the suit. Even if it had an unfavorable opinion of counsel, we agree with EMS that under the circumstances, its decision to defer sale of the accused product was more consistent with satisfying its duty of due care to avoid or minimize infringement than with willfulness. EMS sought a judicial determination of the contested issues before selling the accused product. It was only in the face of three motions to dismiss, two denied and one threatened, and in light of the magistrate's statement that, "absent at least one sale by EMS in the United States, the court would dismiss the infringement issue for lack of subject matter jurisdiction," that EMS sold six devices. The infringement therefore was *de minimis* and was accomplished only to avoid dismissal and ensure prompt adjudication, not as part of its business to generate income. EMS's conduct throughout the litigation was to seek resolution of the controversy. *See Minnesota Mining*, 929 F.2d at 673, 18 USPQ2d at 1305. This case does not involve a "wanton disregard of the patentee's patent rights." *See Read*, 970 F.2d 826, 23 USPQ2d 1435.

On reconsideration, the district court further stated that "EMS's failure to produce an exculpatory legal opinion gives rise to the inference that it proceeded with this lawsuit against the advice of counsel. It is on this basis that the findings of willfulness and 'an exceptional case' were made." *Electro* II, slip op. at 20. However, filing suit is not willful infringement. Moreover, EMS testified as to its good faith belief that the patents were either invalid or not infringed. Although we have affirmed the court's determinations of infringement and validity, it is clear to us that EMS had a basis for its arguments on the merits. Dentsply itself agreed at oral argument that "there were definitely arguments" with respect to the issues in this case. The questions were indeed close, and this was another relevant factor overlooked in the assessment of willfulness. *See Paper Converting Mach. Co. v. Magna-Graphics Corp.*, 745 F.2d 11, 20, 223 USPQ 591, 597-98. (Fed. Cir. 1984) (willfulness finding is generally inappropriate when the infringer mounts a good faith and substantial challenge to the existence of infringement). The facts here do not constitute clear and convincing evidence of willfulness. Upon review of the evidence in its entirety, we are left with the definite and firm conviction that the court erred in finding willful infringement.

"The paramount determination in deciding to grant enhancement and the amount thereof is the egregiousness of the defendant's conduct based on all the facts and circumstances." *Read*, 970 F.2d at 826, 23 USPQ2d at 1435. Absent willful infringement, there is no basis in this case for increased damages. The court expressly declined to find that EMS had engaged in misconduct or copying. *Electro* I, slip op. at 72-73, 79-80 n.24. *See Read*, 970 F.2d at 826-27, 23 USPQ2d at 1435-36 (listing factors to be considered in determining whether to award increased damages). These factors, in addition to those discussed above with respect to willfulness, compel the conclusion that the award of increased damages was an abuse of discretion. *See Kloster*, 793 F.2d at 1580, 230 USPQ at 91 ("[i]f infringement [is] . . . innocent, increased damages are not awardable for infringement."). Likewise, the award of attorney fees, based on an erroneous finding of willfulness, cannot stand. *See Studiengesellschaft*, 862 F.2d at 1579, 9 USPQ2d at 1287 (where judge rejected master's willfulness finding, it was proper to reverse the award of increased damages and attorney fees).

CONCLUSION

That part of the judgment holding U.S. Patents 3,882,638, 3,972,123, and 4,412,402 infringed and not invalid is affirmed. That part of the judgment awarding increased damages and attorney fees is reversed because the court's finding of willful infringement was clearly erroneous.

COSTS

Each party shall bear its own costs.

AFFIRMED-IN-PART and REVERSED-IN-PART

U.S. District Court
District of New Jersey

National Kitchen Products Co. v. The Butterfly Co. Inc.

No. 93-2912 (WGB)

ETHICON ENDO–SURGERY, INC., Plaintiff/Counterclaim Defendant–Appellant,

and

Ethicon, Inc., Counterclaim Defendant–Appellant,

v.

UNITED STATES SURGICAL CORPORATION, Defendant/Counterclaimant–Appellee.

No. 96–1008.

United States Court of Appeals, Federal Circuit.

Aug. 29, 1996.

Rehearing Denied Oct. 17, 1996.

Holder of reissue patent covering lockout device for linear cutter staplers used in surgery brought infringement action against competitor. The United States District Court for the Southern District of Ohio, S. Arthur Spiegel, J., dismissed action, 900 F.Supp. 172, and holder appealed. The Court of Appeals, Clevenger, Circuit Judge, held that: (1) claim in original patent was directed only to lockout mechanism which functioned by blocking longitudinal slots in staple cartridge; (2) term "pusher assembly" as used in patent encompassed both pusher bars and cam retainer bar, but not any other elements; (3) accused device did not meet claim limitation that lockout barrier be maintained "out of the path of the pusher assembly during staple firing"; and (4) remand for findings on issue of infringement under doctrine of equivalents was required.

Affirmed in part, vacated in part, and remanded.

1. Patents ⇐314(5), 324.55(1)

Patent claim construction is matter of law which Court of Appeals reviews de novo.

2. Patents ⇐235(2)

Where claim of patent for surgical cutter staplers with lockout mechanism contained clause beginning "the improvement comprising," which stated nothing about structure of lockout mechanism, but described location of mechanism as "connected to said longitudinal slots," one of ordinary skill would understand limitation to mean that lockout barrier entered longitudinal slots and blocked stapler's pusher bars from passing through slots when second firing of stapler was attempted; claim thus was not infringed by accused device which functioned by impeding cam bar retainer, rather than pusher bars.

3. Patents ⇐101(2)

In patent for surgical cutter staplers with lockout mechanism which placed mechanism on staple cartridge, term "staple cartridge" could be defined with reference to patent's specification, as reference to specification did not import additional limitation into claim, but, rather, aided interpretation of term already in claim.

4. Patents ⇐101(2)

In patent for surgical cutter staplers with lockout mechanism, term "connected to," hich was used in description of lockout mechanism as "connected to" longitudinal slots, would not be read so broadly as to include two distant elements which were "connected" by intervening elements, as such interpretation would effectively render "connected to" limitation meaningless.

See publication Words and Phrases for other judicial constructions and definitions.

5. Patents ⇐101(2)

In patent claim for surgical cutter staplers with lockout mechanism, term "pusher assembly" would not be deemed equivalent to term "pusher bars," as use of terms in same clause of claim indicated that terms were not synonymous.

6. Patents ⇐235(2)

In patent claim for surgical cutter staplers with lockout mechanism, term "pusher assembly" encompassed cam bar retainer as well as pusher bars, but no other elements, in view of prosecution history of patent holder's attempt to have interference declared between its patent and patent issued to third party in which holder employed term "pusher assembly" as used in claim of third party's patent, which included cam bar retainer, and

ambiguity of patent as to inclusion of any other elements.

See publication Words and Phrases for other judicial constructions and definitions.

7. Patents ⇐235(2)

Competitor's endoscopic lockout used in surgical cutter staplers did not literally meet limitation of patent claim for open stapler which required movement of pusher assembly to retracted position; term "pusher assembly," as used in patent claim, included only pusher bars and cam bar retainer, competitor's endoscopic staplers did not appear to contain cam bar retainer, and pusher bars in competitor's staplers were not retracted after firing but rather were left in forward position.

8. Patents ⇐168(2.5)

Fact that, during reissue proceeding, examiner rejected patent claim for surgical cutter stapler which recited lockout mechanism located "on the stapler" as unsupported by specification and found that claim was limited to devices in which mechanism was located on staple cartridge did not indicate that examiner considered all of patent's claims to be limited to lockout mechanism located on cartridge, and other claims could be read broadly to encompass lockout mechanisms located off of cartridge.

9. Federal Courts ⇐759.1

Court of Appeals must affirm decision of district court if it is supported by any ground properly preserved on appeal.

10. Patents ⇐235(2)

Patent claim for surgical cutter staplers which recited that lockout barrier was maintained "out of the path of the pusher assembly during staple firing," did not encompass accused device in which lockout mechanism released barrier into path of pusher assembly before any staples were fired, and other claim language, allegedly indicating that whether barrier was still restrained as staples were actually being ejected was irrelevant, could not read this limitation out of claim.

11. Patents ⇐237

Patent infringement under doctrine of equivalents frequently turns on questions of fact, such as whether allegedly infringing device performs substantially same function in substantially same way to achieve substantially same result as claimed invention.

12. Patents ⇐314(6), 324.60

District court's failure, in granting dismissal in patent infringement action, to provide findings with respect to whether any triable issues of fact remained as to issue of infringement under doctrine of equivalents warranted remand.

Gerald Sobel, Kaye, Scholer, Fierman, Hays, and Handler, LLP, New York City, argued, for plaintiff/counterclaim defendant-appellant Ethicon Endo-Surgery, Inc. and counterclaim defendant-appellant Ethicon, Inc. With him on the briefs were Aaron Stiefel, Daniel P. DiNapoli, New York City, Robert A. Pitcairn, Jr., Cincinnati, OH, and Eric I. Harris, New Brunswick, NJ.

Eric J. Lobenfeld, Chadbourne & Parke LLP, New York City, argued, for defendant/counterclaimant-appellee. With him on the brief was Drew M. Wintringham. Of counsel were Thomas R. Bremer and John C. Andres, United States Surgical Corporation, Norwalk, Connecticut.

Before CLEVENGER, Circuit Judge, COWEN, Senior Circuit Judge, and SCHALL, Circuit Judge.

CLEVENGER, Circuit Judge.

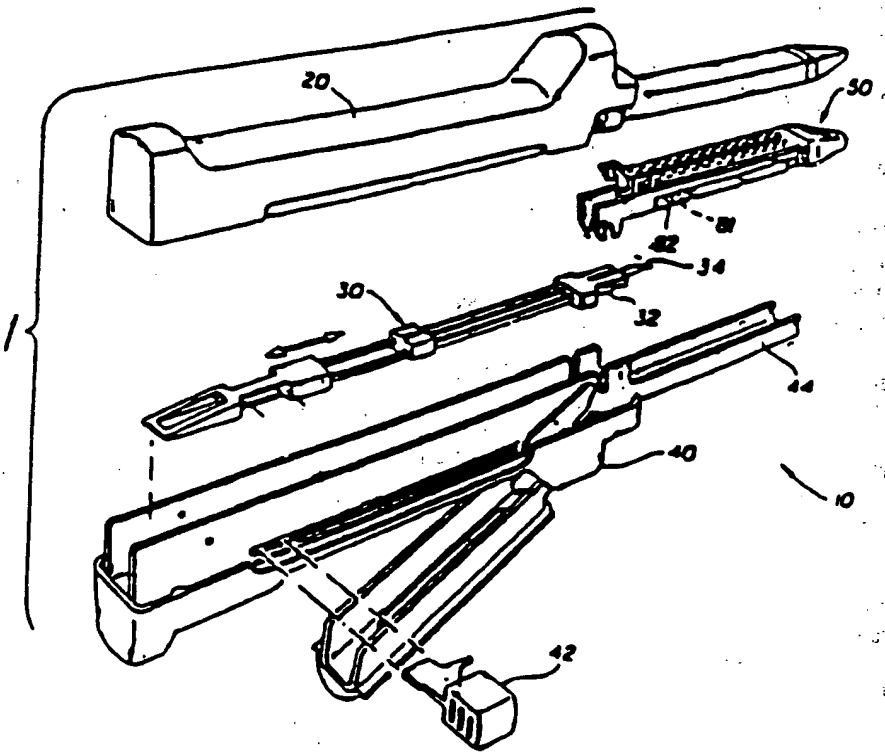
Ethicon Endo-Surgery, Inc. (Ethicon) appeals a decision of the District Court for the Southern District of Ohio granting summary judgment of noninfringement to United States Surgical Corp. (U.S. Surgical) with respect to claims 6 and 24 of U.S. Reissue Patent No. 34,519 ('519). *Ethicon Endo-Surgery v. United States Surgical Corp.*, 900 F.Supp. 172, 38 USPQ2d 1385 (S.D.Ohio 1995). We affirm-in-part, vacate-in-part, and remand.

I

Linear cutter staplers (staplers) are surgical instruments used to cut internal body tissue while simultaneously placing rows of staples along both sides of the incision in order to prevent excessive bleeding. It is important, therefore, that the stapler not be used when its staple cartridge is empty. The '519 patent discloses a "lockout mechanism" for ensuring that once the staple cartridge is emptied, the stapler cannot be used again before the spent staple cartridge is replaced. The '519 patent is a reissue of U.S. Patent No. 4,892,244 ('244).

The reissue patent discloses several embodiments which work similarly. Illustratively, Fig. 1 of the reissue patent, reproduced below, depicts a stapler 10[1] comprising an upper jaw 20, a firing means 30, a lower jaw 40 and a staple cartridge 50 which fits within lower jaw 40. During operation, firing knob 42 is pushed forward which causes both knife 34 and pusher bars 32 (also known as "cam bars") to advance. As knife 34 creates an incision, pusher bars 32 enter slots 33 (shown in Fig. 2 below) in the staple cartridge where they engage staple drivers and cause the staple drivers to eject staples along the two sides of the incision.

FIG-1

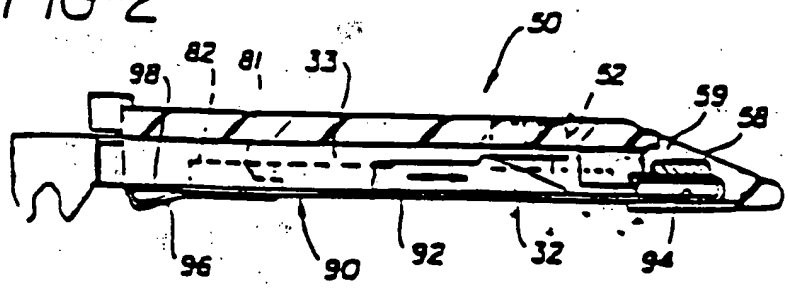


Also reproduced below is Fig. 2 of the reissue patent which is an elevation view of the lockout mechanism during firing of the stapler. As shown in Fig. 2, lockout mechanism 90 comprises a strip 92, a barrier lock 96 biased to enter slots 33, and a restraining member 98 to inhibit barrier lock 96 from entering slots 33. As the stapler is fired, pusher bars 32 slide forward until they reach and engage the front end 94 of strip 92, thus sliding strip 92 forward. As a result, re-

1. Two types of staplers are at issue in this case. The first are called "open" staplers and are used in conventional surgery. The second are called "endoscopic" staplers and are used in endoscopic surgery. The stapler shown in the '519 patent is an open stapler.

straining member 98 slides forward to a point where it no longer inhibits barrier 96. At this point in the firing, however, barrier 96 is still not able to enter slots 33 because of the presence of pusher bars 32. As the pusher bars 32 are retracted, however, barrier 96 enters slots 33 and prevents pusher bars 32 from reentering slots 33. In this way, barrier 96 prevents the stapler from being refired.

FIG-2



William D. Fox et al., assignors to Ethicon, applied for and received the '244 patent, which issued on January 9, 1990. Claim 6 of that patent, the only claim from the original patent which is at issue in this case, recites:

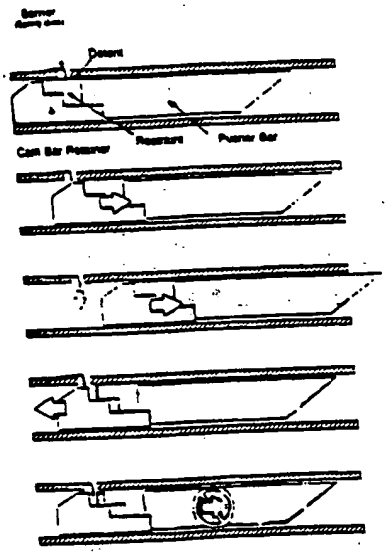
> In a staple cartridge insertable within a surgical stapler and containing staples and comprising an elongated body including one or more longitudinal slots for slidably receiving one or more longitudinal pusher bars comprising a firing mechanism of said surgical stapler, and a plurality of drivers engageable by said pusher bars for ejecting the staples from the cartridge, said staple cartridge releasably fastened to a said surgical stapler,
>
> the improvement comprising a lockout mechanism connected to said longitudinal slots for preventing said pusher bars from passing more than one time through said longitudinal slots.

(emphasis added).

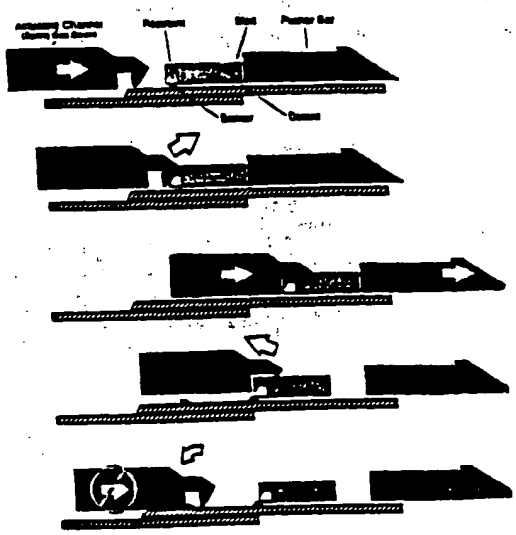
Subsequently, Ethicon became concerned that this claim might not read on several lockout mechanisms employed by its competitor U.S. Surgical. As is illustratively shown in the trial exhibit drawings reproduced below, the lockout mechanism on U.S. Surgical's open staplers functions by impeding the cam bar retainer, rather than the pusher bars.[2] In addition, U.S. Surgical's endoscopic staplers utilize a somewhat different lockout mechanism which engages another portion of the firing assembly called the "actuating channel." Arguably, then, U.S. Surgical's lockouts do not infringe claim 6 because they do not comprise a barrier which enters the longitudinal slots to prevent the pusher bars from reentering the staple cartridge.

2. The cam bar retainer holds the pusher bars and is located behind the pusher bars in the stapler's firing assembly.

U.S. Surgical open stapler lockout



U.S. Surgical endoscopic stapler lockout



Seeking to broaden its claims to cover U.S. Surgical's product, Ethicon put its patent into reissue. One of these broader claims, claim 24, is asserted by Ethicon against U.S. Surgical in this case. Claim 24 recites:

A surgical stapler comprising

a frame,

a cartridge filled with staples and positionable in operative association with said frame and having one or more slots,

a firing assemblage including **a pusher assembly** moveable relative to said frame, said pusher assembly comprising one or more pusher bars respectively extending through said slots to fire said staples,

a member operatively connected to said pusher assembly for moving the pusher assembly in a firing direction down a path to fire the staples, and in a direction opposite to said firing direction to a retracted position after at least a portion of the staples have been fired,

a lockout mechanism for preventing firing movement of the pusher assembly in the firing direction after the pusher assembly has been moved to the retracted position, said lockout mechanism including a barrier assemblage for preventing movement of the pusher assembly from said retracted position, said barrier assemblage comprising a resilient projecting member normally biased toward a position to engage said pusher assembly to prevent movement of said pusher assembly relative to said resilient projecting member after said pusher assembly has been moved to said retracted position, and

a restraining structure separate from said pusher bar for blocking said barrier assemblage to maintain said resilient projecting member out of the path of the pusher assembly during staple firing, said restraining structure being moveable by said pusher assembly during movement of the pusher assembly in the firing position whereby the barrier assemblage is released to allow the resilient projecting member to move into the path of the pusher assembly to prevent firing movement of said pusher assembly after movement thereof to said retracted position.

(emphasis added).

Facially, the primary distinction between claims 6 and 24 is that claim 6 seems to tie the location of the lockout mechanism to the slots through which the pusher *bars* pass,

while claim 24 broadly describes the location of the lockout as anywhere in the path of the pusher *assembly*.

One week after its patent was reissued on January 25, 1994, Ethicon sued U.S. Surgical for infringement asserting that several of U.S. Surgical's staplers infringed claims 6 and 24 of the '519 patent. Discovery was conducted and the case was set for jury trial on April 10, 1994. On the eve of trial, however, we issued our in banc decision in *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 34 USPQ2d 1321 (Fed.Cir.1995) (in banc), *aff'd*, — U.S. —, 116 S.Ct. 1384, 134 L.Ed.2d 577, 38 USPQ2d 1461 (1996), in which we held that claim interpretation is for the judge, not the jury, to determine. As a result, the parties agreed that a pre-trial *Markman* hearing would be beneficial to determine the scope of the claims at issue.

A five day hearing was held, at the close of which the district court interpreted the claims. On the basis of the claim language and the prosecution history, the district court concluded that both claims 6 and 24 must be read narrowly as requiring the lockout mechanism to engage the pusher bars rather than any other portion of the firing assembly. Since U.S. Surgical's lockout barriers do not engage the pusher bars, but instead engage the cam bar retainer or other portions of the firing assembly, the district court proceeded to hold, as a matter of law, that U.S. Surgical's staplers do not literally infringe claims 6 or 24 of the '519 patent. In addition, the district court seems to have determined as a matter of law that U.S. Surgical's staplers do not infringe under the doctrine of equivalents since the judgment from the district court dismisses Ethicon's suit with prejudice. The district court, however, presented no findings to explain its doctrine of equivalents holding.

Ethicon appeals from the district court's judgment. With respect to literal infringement, Ethicon contends that the district court read claims 6 and 24 too narrowly and that those claims are broad enough to cover devices in which the lockout barrier engages portions of the firing assembly other than the pusher bars. Additionally, Ethicon asserts that it was inappropriate for the Court to grant judgment as a matter of law on the doctrine of equivalents at the close of the *Markman* hearing. Ethicon believes that disputed issues of fact remain with respect to infringement by equivalents and that it is entitled to a jury trial on those issues. We have jurisdiction to review the district court's judgment under 28 U.S.C. § 1295(a)(1) (1994).

II

[1] Claim construction is a matter of law which we review de novo. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1581–82 (Fed.Cir.1996) (citing *Markman*, 52 F.3d at 979, 34 USPQ2d at 1329).

[2] We agree with the district court's interpretation of claim 6. Initially, we note that claim 6 is a *Jepson* claim. *See Ex parte Jepson*, 243 O.G. 525 (Ass't Comm'r Pat. 1917). Consequently, the inventive portion of the claim must lie in the clause beginning: "the improvement comprising." *See In re Simmons*, 50 C.C.P.A. 990, 312 F.2d 821, 824 (1963). As is evident, that clause says nothing about the structure of the lockout mechanism; it describes only the lockout's location and function. As to location, the claim states that the lockout is "connected to said longitudinal slots." We agree with the district court that in the context of this claim one of ordinary skill would understand this limitation to mean that the lockout barrier enters the longitudinal slots and thus blocks the pusher bars from passing through the slots when a second firing of the stapler is attempted.

Several considerations support this conclusion. Looking first at the claim itself, we note that the functional language at the end of the claim recites that the purpose of the lockout is to prevent the pusher bars from passing again through the longitudinal slots, rather than describing in more general terms that the function is to prevent refiring of the stapler. This is some indication that what is being described is an operative relationship between the lockout barrier and the longitudinal slots.

[3] In addition, as the district court noted, the claim's preamble places the lockout mechanism "in a staple cartridge." "Staple cartridge" is a term used in the '519 specifi-

cation to describe element 50 of Fig. 1 above. The only interaction between the staple cartridge and the firing assembly occurs when the pusher bars (and knife) pass through the longitudinal slots. This demonstrates that claim 6 is limited to an apparatus which blocks the pusher bars rather than more distal portions of the firing assembly, such as the cam bar retainer.

On this point, Ethicon argues that the term "staple cartridge" should not be defined with reference to the specification, but rather should be understood broadly to include any portion of the surgical stapler which is "insertable within and releasably fastened to" the stapler. Citing *Electro Medical Systems, S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 1054, 32 USPQ2d 1017, 1021 (Fed.Cir. 1994), for the proposition that particular embodiments from the specification should not be read into the claims, Ethicon urges that it is inappropriate to import the meaning of "staple cartridge" from the specification into this claim. Ethicon further points out that the cartridge in U.S. Surgical's staplers comprise more than just stapler cartridge 50 shown in Fig. 1 above, but additionally includes the entire firing means 30, including the pusher bars, the knife, the cam bar retainer, and the lockout mechanism. Consequently, under a broad interpretation of the term "staple cartridge," Ethicon asserts that its claim reads on U.S. Surgical's staplers.

Ethicon's reliance on *Electro Medical*, however, is misplaced. Here, the district court did not import an additional limitation into the claim; instead, it looked to the specification to aid its interpretation of a term already in the claim, an entirely appropriate practice. *See Autogiro Co. of America v. United States*, 181 Ct.Cl. 55, 384 F.2d 391, 397–98, 155 USPQ 697, 702–03 (1967). The specification unambiguously describes the staple cartridge as a separate element distinct from the firing means. Consequently, the district court properly deduced that the term "staple cartridge" in the claim precludes the lockout from being located on the firing means.

[4] Ethicon also challenges the district court's claim interpretation on the ground that the term "connected to" in the phrase "connected to the slots" should be read broadly to include two distant elements which are "connected" by intervening elements. Thus, Ethicon argues, even if, as in the accused devices, the lockout mechanism is located in another portion of the surgical stapler, it is still indirectly "connected to" the longitudinal slots, and thus Ethicon's claim 6 literally reads on it.

We acknowledge that the term "connected to" could, in other contexts, be broadly construed. Nevertheless, in the context of this claim, the district court correctly concluded that the entire phrase "connected to said longitudinal slots" must be read narrowly. First, in what meaningful sense is it possible to "connect" the restraining member, which is a physical item, with the longitudinal slots, which are hollow passageways, unless "connected to" is understood to mean that the restraining member operatively interacts with the longitudinal slots by blocking them? Second, Ethicon's argument proves too much. If, as Ethicon argues, "connected to" should be read broadly to include elements which are connected directly or indirectly, then this language would read on a lockout mechanism located anywhere in the surgical stapler, and the "connected to" limitation would be meaninglessly empty.

We have also considered Ethicon's additional arguments based on the prosecution history which allegedly shows that the examiner viewed claim 6 as including a lockout mechanism located in other portions of the surgical stapler. They are insufficient, however, to overcome our strong sense that claim 6 is directed to a lockout mechanism which functions by blocking the longitudinal slots in the staple cartridge so as to inhibit the pusher bars from passing through the longitudinal slots once the staples in the cartridge have been fired. We therefore affirm the district court's interpretation of claim 6. Since there are no genuine issues of material fact with respect to the structure of U.S. Surgical's staplers, we also affirm the district court's holding that claim 6 is not literally infringed.

III

Turning to claim 24, we agree with Ethicon that the claim reads on a lockout mechanism

which engages portions of the firing means other than the pusher bars. We therefore do not affirm the district court's judgment of noninfringement on the ground articulated by the district court.

Here, the dispute between the parties centers around the term "pusher assembly." According to Ethicon, the "pusher assembly" encompasses not only the pusher bars recited in the claim, but additionally includes the cam bar retainer which holds the pusher bars. Although not separately described in the '519 specification, the cam bar retainer constitutes one element of the firing means 30 in Fig. 1 of the '519 patent; it is the far left element of the firing means. As a result, Ethicon asserts that those of U.S. Surgical's lockouts which engage the cam bar retainer literally infringe this claim. U.S. Surgical, on the other hand, contends that "pusher assembly" is merely a synonym for "pusher bars," and that claim 24, like claim 6, is limited to a lockout which engages the pusher bars.

The district court began its analysis by noting that the claim itself does not define the makeup of the "pusher assembly" beyond stating that it "compris[es] one or more pusher bars." Furthermore, the term "pusher assembly" is not used or defined anywhere in the '519 specification, so the specification provides minimal guidance as to the meaning of this claim term. The district court also noted that neither party's proposed claim interpretation was necessarily inconsistent with other portions of claim 24, or with the rest of the patent document as a whole. *Cf. Markman*, — U.S. at —, 116 S.Ct. at 1395, 38 USPQ2d at 1470 (noting the possibility that two proposed claim interpretations will each be "consistent with [the] patent's internal logic"). Consequently, the district court determined that the scope of the term "pusher assembly" was ambiguous.

Faced with what it considered an ambiguous term, the district court adopted U.S. Surgical's narrow claim interpretation over Ethicon's broader proposal, stating: "we return to the view that since Ethicon sought reissue for the specific purpose of extending Fox's invention to cover U.S. Surgical's lockout, some unambiguous disclosure of that coverage should be found in Claim 24." Since reissue claim 24 did not, in the district court's opinion, *unambiguously* cover the allegedly infringing staplers, the district court adopted a claim interpretation under which the staplers do not infringe. The district court additionally bolstered its claim interpretation with two pieces of prosecution history which it believed supported its interpretation of the claim. Accordingly, it held that "pusher assembly" means the same as "pusher bars," and determined as a matter of law that U.S. Surgical's staplers do not infringe claim 24 since U.S. Surgical's lockout does not engage the pusher bars.

[5] We need not pass on the district court's reasoning that reissue claims sought for the purpose of covering a specific competitor's product must unambiguously read on the allegedly infringing product, because we conclude that claim 24 is not, with respect to whether the pusher assembly comprises the cam bar retainer, ambiguous. Like the district court, we begin with the language of the claim itself. Admittedly, the claim says little about the structure of the "pusher assembly." It does clearly imply, however, that whatever "pusher assembly" means, it is not a synonym for "pusher bar." For example, the claim recites:

> a restraining structure separate from said **pusher bar** for blocking said barrier assemblage to maintain said resilient projecting member out of the path of the **pusher assembly** during staple firing.

(emphasis added). If the terms "pusher assembly" and "pusher bar" described a single element, one would expect the claim to consistently refer to this element as *either* a "pusher bar" or a "pusher assembly," but not both, especially not within the same clause. Therefore, in our view, the plain meaning of the claim will not bear a reading that "pusher assembly" and "pusher bar" are synonyms.

[6] The question remains, though, what is the meaning of the term "pusher assembly"? The answer to that question lies in the '519's

prosecution history. The term "pusher assembly" entered Ethicon's lexicon as part of an attempt by Ethicon to have an interference declared between its patent and a second patent issued to Tompkins et al. (Tompkins) and owned, not surprisingly,[3] by U.S. Surgical. Like U.S. Surgical's commercial embodiments, Tompkins discloses and claims a lockout mechanism which engages the cam bar retainer.

In support of its request for an interference, Ethicon copied claim 1 of Tompkins and submitted a chart to the U.S. Patent Office in which it asserted that Fox disclosed each element of the claim. In relevant part, that chart stated:

[Tompkins' claim]	[Ethicon's comments]
A surgical fastening apparatus comprising:	Applicants [i.e., Fox] disclose a surgical stapler 10
...	...
a **pusher assembly** slidably mounted on said cartridge frame ..., **said pusher assembly having at least one cam bar** longitudinally movable through said cartridge [to engage staple drivers];	Applicants disclose a pusher bar 32 that is mounted between the upper jaw 20 and lower jaw 40 that form the cartridge frame. The bar 32 slidably moves within longitudinal slot 33 of the cartridge to sequentially engage the drivers 52 ....
and a cam bar retainer for mounting said at least one cam bar; and	Applicants disclose a firing means 30 whereon a cam bar 32 is retained.
locking mechanism means engageable with said cam bar retainer for preventing reactuation of the surgical stapling apparatus.	Applicants disclose a locking mechanism including a barrier lock 96 that engages with the cam bar 32 to prevent reactuation of the stapler. The aforementioned teaching is the same since to engage the cam bar is no different that engaging a retainer that holds the cam bar.

As this chart demonstrates, the term "pusher assembly" in Tompkins' claim is not used as a synonym for "pusher bar." Instead, it describes an "assembly"[4] which comprises, at a minimum, the pusher bars as well as the cam bar retainer.[5]

In response, U.S. Surgical argues that Ethicon cannot rely on Tompkins' disclosure to define the term "pusher assembly" since claim 24 demonstrably uses the term differently than Tompkins' *specification*. Specifically, Tompkins' specification defines the "pusher assembly" as including the firing knob, while claim 24 describes the firing knob as a distinct element separate from the "pusher assembly." This argument is not without some merit. In our view, however, the prosecution history as a whole would

3. In its opinion denying Ethicon's motion for a preliminary injunction, the district court pointed out that Ethicon and U.S. Surgical are, for practical purposes, the only two manufacturers of the type of surgical staplers involved in this suit. *Ethicon Endo–Surgery v. United States Surgical Corp.*, 855 F.Supp. 1500, 1505 (S.D.Ohio 1994).

4. Although not necessary to resolve this case because of the clear prosecution history, we note in passing that the word "assembly" itself implies a multi-component apparatus. The *McGraw Hill Dictionary of Scientific and Technical Terms* 133 (4th ed.1989), for example, defines "assembly" as: "A unit containing the component parts of a mechanism, machine, or similar device."

5. That the cam bar retainer is part of the pusher assembly is evident from the fact that recitation of the cam bar retainer is prefaced by the word "and." If the cam bar retainer was not part of the pusher assembly, then cam bar retainer would simply be the penultimate limitation in the claim and would not be prefaced by the word "and." In addition, comparison of Tompkins' claim 1 with Ethicon's chart reveals that the chart contains a typographical error. In Tompkins' claim, the cam bar and cam bar retainer recitations are separated by a comma, another indication that both elements are part of the pusher assembly; the chart, in contrast, mistakenly separates those elements with a semicolon.

Ironically, this chart was one of the pieces of prosecution history relied on by the district court to support its holding that the "pusher assembly" consists only of the pusher bars. In doing so, the district court was apparently misled by the fact that row 3, column 1 of the chart begins with the phrase "a pusher assembly slidably mounted on said cartridge frame" which Ethicon (in row 3, column 2) seems to equate with its pusher bars 32. As we have noted, however, a better reading of the chart is that the "pusher assembly" comprises two components: the cam bars (row 3) and a cam bar retainer (row 4), both of which, Ethicon contended, are disclosed in Fox's specification.

convey to one of ordinary skill that Ethicon intended to employ the term "pusher assembly" as used in Tompkins' *claim*, rather than as used in Tompkins' *specification*. We therefore hold that the term "pusher assembly" in claim 24 encompasses both the pusher bars and the cam bar retainer.

In view of our holding in *Athletic Alternatives, Inc. v. Prince Manufacturing, Inc.*, 73 F.3d 1573, 37 USPQ2d 1365 (Fed.Cir.1996) (*AAI*), however, we do not believe that the term "pusher assembly" can be interpreted as covering any additional elements other than the pusher bars and the cam bar retainer. In *AAI*, we held that a patent claim may be interpreted only as broadly as its unambiguous scope. *AAI*, 73 F.3d at 1581, 37 USPQ2d at 1372. There, AAI had patented a stringing arrangement for tennis rackets in which the strings were offset at distances which "varie[d] between" a minimum and a maximum distance from the racket's central plane. *AAI*, 73 F.3d at 1577, 37 USPQ2d at 1369. Both parties conceded that the phrase "varie[d] between" unambiguously covered a stringing arrangement in which three or more offset distances were employed. *Id.* Both also conceded that a stringing arrangement which employed only a single offset distance was anticipated by the prior art. *AAI*, 73 F.3d at 1575, 37 USPQ2d at 1367. The question in the case was whether AAI's claim was sufficiently broad to cover a stringing arrangement which employed exactly two offset distances. After examining in great detail the patent document and its prosecution history, we concluded that, at the edges, the reach of the claim was ambiguous, and that we could not tell to a satisfactory degree of certainty whether it read on a racket with only two offset distances. *AAI*, 73 F.3d at 1578–81, 37 USPQ2d at 1370–72. Having so concluded, we held, derived from our understanding of the second paragraph of 35 U.S.C. § 112 (1994), that to the extent that the claim is ambiguous, a narrow reading which excludes the ambiguously covered subject matter must be adopted. *AAI*, 73 F.3d at 1581, 37 USPQ2d at 1372.

Here, too, we have expended significant effort endeavoring to ascertain the proper construction of the term "pusher assembly" in claim 24. As has already been noted, the '519 specification provides minimal guidance on this question. Similarly, as U.S. Surgical points out, the Tompkins' specification which originated the term is of little, if any, help. Without more explicit alternatives, we have been forced to spend a significant quantity of time carefully sifting through each piece of the reissue prosecution history made part of the appellate record in an effort to discover the term's proper meaning. As noted above, that reading convinces us that the "pusher assembly" unambiguously includes the cam bar retainer in addition to the pusher bars expressly recited in the claim.

More than that, however, we cannot say. On the one hand, an argument could be made that Ethicon intended the term "pusher assembly" essentially as a synonym for its firing means 30. *Compare* Joint Appendix at 3044 ("the original claims did not specify, as broadly as applicants had a right to claim ... a lockout mechanism that ... blocks the **firing means** and prevents refiring of the stapler" (emphasis added)) *with* Joint Appendix at 3127 ("The **essence** of applicants' invention is the provision of a lockout mechanism in a surgical stapler that is actuated during initial longitudinal movement of a **firing means such as a pusher assembly.**" (emphasis added)) *and* Joint Appendix at 3134 ("the **essence** of applicants' invention ... provides that when the **pusher assembly** is retracted after longitudinal movement, a locking mechanism will be activated to prevent subsequent longitudinal movement." (emphasis added)). On the other hand, in many of the reissue claims, Ethicon implied that they are not synonyms by employing both terms in the same claim and reciting that the firing means "includes" the pusher assembly. *See, e.g.*, Joint Appendix at 3417 (claim 17 of the '519 patent which recites "a firing means including a pusher assembly"). Consequently, we conclude that the term "pusher assembly" unambiguously describes only the pusher bars and the cam bar retainer, but does not unambiguously cover any other portions of the '519 patent's firing means.

[7, 8] In view of the above, Ethicon's claim 24 would read on a lockout which engaged the cam bar retainer, such as U.S. Surgical's open linear cutters, while it would not read on a lockout which engaged any other portion of the firing means, such as U.S. Surgical's endoscopic lockouts.[6] Since at least some of U.S. Surgical's staplers comprise a lockout which engages the cam bar retainer, we do not affirm the district court's judgment of noninfringement with respect to claim 24 on the ground articulated by the district court.[7]

[9, 10] Our task, however, is not over. We must affirm the decision of the district court if it is supported by any ground properly preserved on appeal. *See Datascope Corp. v. SMEC, Inc.*, 879 F.2d 820, 822 n. 1, 11 USPQ2d 1321, 1322 n. 1 (Fed.Cir.1989) ("Appellees always have the right to assert alternative grounds for affirming the judgment that are supported by the record."), *cert. denied*, 493 U.S. 1024, 110 S.Ct. 729, 107 L.Ed.2d 747 (1990). Here, U.S. Surgical contends that it does not infringe claim 24 on an additional ground not relied on by the district court. Specifically, claim 24 recites that the lockout barrier (i.e., resilient projecting member) is maintained "out of the path of the pusher assembly *during staple firing.*" As Ethicon candidly conceded at oral argument, however, U.S. Surgical's lockout mechanism releases the barrier into the path of the pusher assembly before any staples are fired. Thus, U.S. Surgical's lockout does not, on its face, literally infringe claim 24.

In response, Ethicon argues that other portions of the claim as well as the prosecution history make it clear that "it is irrelevant whether the [barrier is still restrained] as the staples are actually being ejected" and that successful operation of the lockout requires only that the barrier be restrained long enough for the firing assembly to begin movement in the firing direction. Ethicon's argument simply does not address the fact that U.S. Surgical's barrier is *in* the path of the pusher assembly before any staples are fired. Ethicon's reliance on other claim language to overcome this fact invites us to read its "during staple firing" limitation out of the claim. This we cannot do. *See Exxon Chemical Patents, Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1557, 35 USPQ2d 1801, 1804 (Fed. Cir.1995) (recognizing that "[w]e must give meaning to all the words in [the] claims").

The claim recites that the barrier is maintained out of the path of the pusher assembly "during staple firing." The plain meaning of this limitation requires that the barrier re-

6. On similar grounds we reject Ethicon's argument that U.S. Surgical's endoscopic lockout literally meets claim 24's limitation requiring "movement [of the pusher assembly] to [a] retracted position." As noted above, the term "pusher assembly" includes only the pusher bars and the cam bar retainer. U.S. Surgical's endoscopic staplers, however, do not appear to contain a cam bar retainer and the pusher bars are not retracted after firing but rather are left in the forward position.

7. The district court also misinterpreted the second piece of prosecution history which it cited in support of its interpretation. During the reissue proceedings, the examiner rejected claim 1 of the original '244 patent which recited a lockout mechanism located "on the stapler" saying: "there is no support in the [Fox] specification for a lockout mechanism that is mounted to the stapler.... The disclosed mechanism is mounted to the cartridge;" and "[c]laim 1 implies that the lockout mechanism is not part of the cartridge." From these statements, the district court erroneously inferred that the examiner considered all of the claims to be limited to a lockout mechanism located on the staple cartridge. In doing so, the district court confused a claim not supported by the specification, which is not allowable, with a broad claim, which is.

Claim 1 was properly rejected because it *recited* an element not supported by Fox's disclosure, i.e., a lockout "on the stapler." It does not follow, however, that Fox's disclosure could not support claims sufficiently broad to read on a lockout off of the cartridge. *See, e.g., In re Vickers*, 141 F.2d 522, 525, 31 C.C.P.A. 985, 61 USPQ 122, 125 (1944) ("an applicant ... is generally allowed claims, when the art permits, *which cover more than the specific embodiment shown.*") If Fox did not consider the precise location of the lockout to be an element of his invention, he was free to draft claim 24 broadly (within the limits imposed by the prior art) to exclude the lockout's exact location as a limitation of the claimed invention. *See* 35 U.S.C. § 112 (1994) (allocating to the *inventor* the task of claiming what "*the [inventor]* regards as his invention." (emphasis added)). Such a claim would not be unsupported by the specification even though it would be literally infringed by undisclosed embodiments. The district court should not have imposed on claim 24 an additional limitation which it does not contain.

main outside the path of the pusher assembly until at least some of the staples have been fired. Ethicon need not have included this limitation in its claim. Having done so, it must live with the language it chose. Since U.S. Surgical's lockout admittedly releases the barrier prior to the firing of any staples, we affirm the district court's judgment that U.S. Surgical does not literally infringe claim 24 of the '519 patent.

IV

At the conclusion of its opinion, the district court dismissed Ethicon's complaint with prejudice. From this it would appear that the district court granted summary judgment to U.S. Surgical with respect to both literal infringement and infringement under the doctrine of equivalents. On this appeal, the parties dispute whether the posture of the case at the close of the *Markman* hearing permitted the grant of summary judgment on the issue of infringement by equivalents. Ethicon contends that the *Markman* hearing established only the literal meaning of the claims, but that genuine issues of material fact may remain with respect to infringement by equivalents. According to Ethicon, the district court never decided whether such issues of fact exist, and therefore could not, at this stage in the proceedings, grant summary judgment on this issue. U.S. Surgical, in contrast, contends that the question of infringement by equivalents was litigated as part of the *Markman* hearing and that, on this record, summary judgment in their favor with respect to infringement by equivalents is warranted.

[11, 12] Infringement under the doctrine of equivalents frequently turns on questions of fact, such as whether the allegedly infringing device performs substantially the same function in substantially the same way to achieve substantially the same result as the claimed invention. *See Hilton Davis Chemical Co. v. Warner–Jenkinson Co., Inc.*, 62 F.3d 1512, 1518, 1520–21, 35 USPQ2d 1641, 1645, 1647 (Fed.Cir.1995), *cert. granted*, —— U.S. ——, 116 S.Ct. 1014, 134 L.Ed.2d 95 (1996). The district court did not provide findings with respect to whether any such triable issues of fact remain in this case. We cannot even tell from the record whether the issue was briefed and argued to the district court. Consequently, to the extent that the district court's judgment constituted a grant of summary judgment of noninfringement under the doctrine of equivalents in favor of U.S. Surgical, we vacate that portion of the judgment and remand to the district court to articulate whether any triable issues of fact with respect to infringement by equivalents exist. If none exist, summary judgment in U.S. Surgical's favor may be appropriate. Otherwise, trial on this issue, and resolution of any other issues remaining in the case (e.g., validity) would be appropriate.

V

For the reasons described above, the judgment of the district court is

AFFIRMED–IN–PART, VACATED–IN–PART, and REMANDED. No costs.

ATTACHMENT D

DESCRIPTION OF EXCERPTS FROM TEXTBOOK ENTITLED: *Optics*, by E. Hecht and A. Zajac (1974, Addison-Wesley)

Fourier Optics is a means of generating an arbitrary linear transformation of one irradiance pattern to another. The *Optics* textbook describes several features beginning at Chapter 7 which covers superposition of waves which is the basis for Fourier Optics and makes it clear that the temporal shape of a pulse is understood by Fourier Analysis. Chapter 11 covers Fourier Optics and its applications and makes it clear that spatial distribution of light is also understood by Fourier Analysis. This chapter includes in Section 3 at Figure 8 an example of a lens used in the context of imaging and not for focusing. Chapter 14 covers two topics in Fourier Optics: imagery and holography; and makes it clear that Fourier Optics is a practical way to generate an arbitrary irradiance pattern. This chapter also includes an explanation of a Fourier transformed hologram generally described at pages 496-499. It includes an example of a beam that begins as essentially Gaussian but then is transformed into two copies of somewhat arbitrary pattern of light appearing to have come from a multiple-meter.

All copies of Chapters 7, 11 and 14 are included in an accompanying IDS.